

## FURTHER KNOWLEDGE OF SOME HETEROGNATHOUS FISHES. PART I.

BY HENRY W. FOWLER.

In this paper I have attempted to arrange systematically the Heterognathi contained in the collections of the Academy of Natural Sciences of Philadelphia. This group is largely made up of collections formed by John Hauxwell, James Orton and H. H. Smith. Nearly all of Cope's typical specimens, besides a number of comparatively rare or obscurely defined species, are represented. Owing to the increase in knowledge of the vast fresh-water ichthyic fauna of South America, it is believed that further detailed information concerning rare, nominal or species only known from the original specimens will be welcomed.

## ERYTHRINIDÆ.

*Hoplias malabaricus* (Bloch).

*Macrodon trahira* Cope, Proc. Amer. Philos. Soc. Phila., XI 1869-70 (August 19, 1870), p. 566. Pebas. John Hauxwell.—Cope, Proc. Acad. Nat. Sci. Phila., 1871 (January 16, 1872), p. 257. Ambyiaeu River. John Hauxwell.—Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 694. Peruvian Amazon. Prof. J. Orton.

*Macrodon taraira* Cope, *l.c.*, XXXIII, 1894 (January 5), p. 84. Brazilian province of Rio Grande do Sul. H. H. Smith.

A series of 28 examples represented by those in the Hauxwell and Orton collections from the Ambyiaeu and Peruvian Amazons, and the H. H. Smith collection from Rio Grande do Sul, also others from Bahia, Rio das Vehlas and Surinam. They show: Head  $2\frac{2}{3}$  to  $3\frac{1}{3}$ ; depth  $3\frac{2}{5}$  to  $5\frac{7}{8}$ ; D. II or III, 10 I to 12 I, mostly 11 I, and only rarely 10 I or 12 I; A. II or III, 8 I or 9 I, most always 8 I, or only rarely 9 I; scales 36 to 42 in lateral line to base of caudal, with 2 to 4 more on latter; 6 scales obliquely back from origin of dorsal to lateral line, only rarely 5; between lateral line and base of ventral 5 or 6 scales, usually 5; 15 to 19 scales before dorsal; snout 4 to  $4\frac{1}{3}$  in head, measured from tip of upper jaw; eye  $4\frac{1}{5}$  to 8; maxillary  $1\frac{1}{8}$  to  $2\frac{1}{10}$ ; interorbital  $3\frac{1}{2}$  to  $4\frac{1}{3}$ ; total length of body  $2\frac{1}{4}$  to  $12\frac{1}{2}$  inches.

OPHIOCEPHALOPS subgen. nov.

Type *Erythrinus untanianus* Agassiz.

Dorsal fin rounded or posterior rays not elevated.

(*Ὀφίτις*, serpent; *κεφαλή*, head; *ὤψις*, appearance.)

**Erythrinus unitæniatus** Agassiz.

*Erythrinus salmoneus* Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 694. Peruvian Amazon. Prof. J. Orton.

Head 3 to  $3\frac{1}{2}$ ; depth  $3\frac{1}{4}$  to  $4\frac{2}{3}$ ; D. II, 8 I; A. II, 7 I to II, 9 I, usually 8 I and rarely 7 I or 9 I; scales 30 to 32 in lateral line to base of caudal, and 3 to 6 more on latter; 4 scales between origin of dorsal and lateral line, rarely 5; 4 scales between lateral line and ventral; 13 or 14 scales before dorsal, usually 14; snout  $3\frac{3}{4}$  to 4 in head, measured from tip of upper jaw; eye 5 to  $7\frac{2}{3}$ ; maxillary 2 to  $2\frac{1}{5}$ ; interorbital space  $2\frac{1}{2}$  to 3; total length 4 to 12 inches. In all 7 examples from the upper Amazons, Surinam and Paramaribo.

## Subgenus ERYTHRINUS Scopoli.

Dorsal fin angular or pointed, and some of posterior rays elevated.

**Erythrinus erythrinus** (Schneider).

*Erythrinus brevicanda* Cope, Proc. Amer. Philos. Soc. Phila., XI, 1869-70 (August 19, 1870), p. 566. Pebas. John Hauxwell.

*Erythrinus brevicauda* Cope, l.c., XVII, 1877-78 (May 17, 1878), p. 694. Peruvian Amazon. Prof. J. Orton.

Head 3 to  $3\frac{1}{2}$ ; depth  $3\frac{3}{4}$  to 5; D. II, 7 I to 9 I, rarely 7 or 8; A. III, 8 I; scales 29 to 32 in lateral line to base of caudal, and 3 or 4 more on latter; 4 scales between origin of dorsal and lateral line obliquely back; 3 or 4 scales between lateral line and ventral; 14 to 16 scales before dorsal; snout  $3\frac{1}{2}$  to 4 in head, measured from tip of upper jaw; eye  $4\frac{1}{3}$  to  $6\frac{2}{3}$ ; interorbital space  $2\frac{1}{3}$  to  $2\frac{3}{4}$ ; total length of body 3 to  $9\frac{1}{4}$  inches. In all 10 examples from the Orton and Hauxwell collections. One example shows the depressed ventral reaching a trifle beyond origin of anal.

**Pyrhulina læta** (Cope). Fig. 1.

*Holotaxis latus* Cope, Proc. Acad. Nat. Sci. Phila., 1871 (January 16, 1872), p. 257. Type No. 8,029, A. N. S. P. Ambyiacu River. John Hauxwell.

As it is in such poor preservation I am forced to omit a number of notes of value. It may be said however beyond dispute that there are two distinct or well developed bands of teeth in the upper jaw. The accompanying figure will portray such information as is possible to make out from the specimen with the assistance of the original account.

## COPEINA gen. nov.

Type *Pyrhulina argyrops* Cope.

Teeth in upper jaw uniserial, otherwise close to *Pyrhulina*.

(Named for the late Prof. Edward Drinker Cope, who studied most of the fishes included in this paper.)

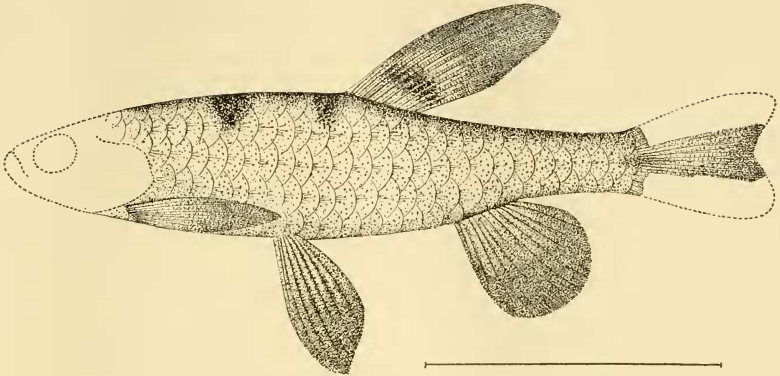


Fig. 1.—*Pyrrhulina lata* (Cope).

**Copeina argyrops** (Cope). Fig. 2.

*Pyrrhulina argyrops* Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 694. Nos. 21,441 (type) and 21,442, A. N. S. P., cotypes. Peruvian Amazon. Prof. J. Orton. Coll. of 1877.

About 11? scales (according to pockets) before dorsal; width of head  $1\frac{3}{4}$  in its length; interorbital space  $2\frac{1}{2}$ . Edges of body rounded. Head broadly depressed or flattened above and becoming somewhat constricted below. Snout broadly flattened above. Surface or man-

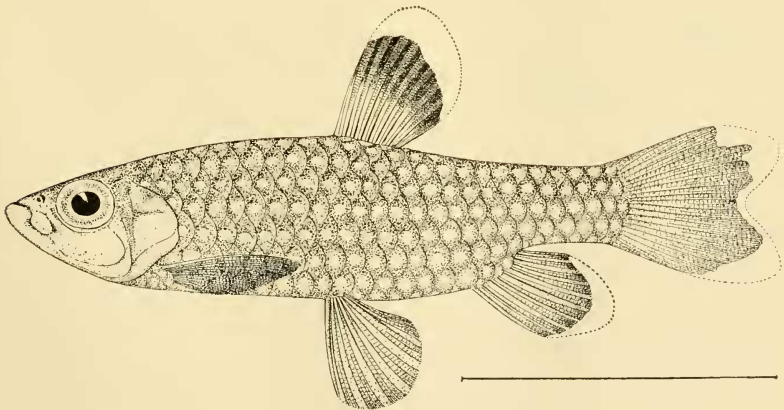


Fig. 2.—*Copeina argyrops* (Cope).

dible well convex. Teeth conic, a little large, uniserial in upper jaw and biserial in lower, though none on maxillary or on roof of mouth. Tongue a little slender or elongate, tip rounded and free. Gill-opening extending forward about opposite front rim of pupil. Rakers  $7+10?$ , lanceolate, a little shorter than filaments which are  $\frac{2}{3}$  of orbit. Isthmus rather narrowly triangular. Each scale with a number of radiating striæ. Color in alcohol plain brown. Upper portion of dorsal more or less blackish with a narrow pale margin. Iris rather brassy. Length  $2\frac{7}{16}$  inches (caudal a little damaged).

### CHARACIDÆ.

#### CURIMATINÆ.

*Curimatella meyeri* (Steindachner). Fig. 3.

Head  $3\frac{2}{5}$ ; depth about 4; D. iv, 9; A. ii, 8; scales (according to pockets) about 38? in lateral line to base of caudal, and about 5? more on latter; between origin of dorsal and lateral line, obliquely forward, about 5?, and about same number between lateral line and origin of ventral; about 16? scales before dorsal; snout  $3\frac{1}{2}$  in head; eye  $3\frac{1}{4}$ ;

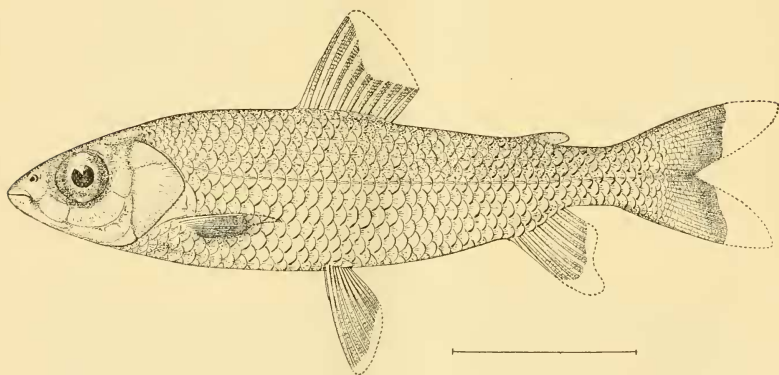


Fig. 3.—*Curimatella meyeri* (Steindachner).

width of mouth 4; maxillary  $4\frac{2}{3}$ ; interorbital space  $2\frac{1}{6}$ ; least depth of caudal peduncle 3. Apparently no rakers. Caudal at present with few scales and these mostly fallen. The color in alcohol, probably due to preservation, is faded brown. This may also account for the absence of spots on the scales of the back. One example (with damaged caudal),  $3\frac{3}{4}$  inches. Peru. Prof. J. Orton. Coll. 1873.



**Curimatella alburnus** (Müller and Troschel).

Head  $3\frac{3}{8}$ ; depth  $2\frac{1}{2}$ ; D. III, 9, 1; A. III, 9, 1; scales 33 in lateral line to base of caudal, and 2 or 3 more on latter; 6 scales obliquely back from origin of dorsal to lateral line; 5 scales between lateral line and origin of ventral; 5 scales between lateral line and origin of anal; snout  $3\frac{3}{8}$  in head; eye  $3\frac{1}{2}$ ; maxillary 3; interorbital space  $2\frac{3}{8}$ ; pectoral  $1\frac{1}{4}$ ; ventral  $1\frac{1}{10}$ . Caudal peduncle deep, compressed, and length about  $\frac{4}{5}$  of least depth. Upper profile convex from occiput to dorsal, and keel only a little distinct just before dorsal, also an indistinct keel on each side. Post-dorsal region rounded, with a median and a lateral keel on each side, all indistinct. Same also continued behind adipose dorsal. Post-ventral region with distinct median keel and a rather indistinct keel on each side converging toward anal. Snout convex, both surface and profile, and upper profile of head straight. Rakers small or minute weak filaments (mostly damaged). Origin of dorsal falling in vertical about midway between tip of snout and posterior basal margin of adipose fin. Third simple dorsal ray longest, longer than head, or about  $\frac{1}{3}$  of head and trunk. First branched anal ray apparently longest,  $1\frac{2}{5}$  in head. Pectoral reaching  $\frac{3}{4}$  of space to ventral. Ventral extending  $\frac{5}{7}$  of space to anal. Length (with damaged caudal)  $5\frac{1}{2}$  inches. A single example, most likely from Dr. Hering's collection, and taken in Surinam?, rather than "*Curimatus spec. indet.*" Cope, *Proc. Amer. Philos. Soc. Phila.*, XI, 1869-70 (August 19, 1870), p. 566, from Pebas, Hauxwell Coll.

## CYPHOCHARAX subgen. nov.

Type *Curimatus spilurus* Günther.

Back well elevated, or hunched, anteriorly. Scales large, in even longitudinal series which slope a little from head posteriorly.

(*Κῶφῶς*, gibbous or hunched; *χάπαξ*, an old name used by Gronow for the typical genus of this family and first introduced by Scopoli.)

**Curimata spilura** (Günther). Fig. 4.

*Curimatus spilurus* Cope, *Proc. Amer. Philos. Soc. Phila.*, XVII, 1877-78 (May 17, 1878), p. 684. Peruvian Amazon. Prof. J. Orton. Coll. of 1873.

Interorbital space  $2\frac{3}{8}$  in head. Predorsal region trenchant, not grooved, and anterior dorsal profile of body steep. Gill-rakers not evident and scales not serrate. The example figured most likely from Nauta. Also three others which do not vary except that the hump, or elevated back, seems to be a little less in height than in the smaller ones. This agrees fairly well with Dr. Günther's account, though the

head would differ as it is said to be  $3\frac{3}{4}$  to 4 in the body without caudal. The pectoral is apparently shorter in my examples.

The closely related forms, *Curimata spiluropsis* (Eigenmann and Eigenmann) and *Curimata dorsale* (Eigenmann and Eigenmann), do not appear to differ markedly. In fact it is not difficult to discover most of the characters assigned to each by Dr. and Mrs. Eigenmann in

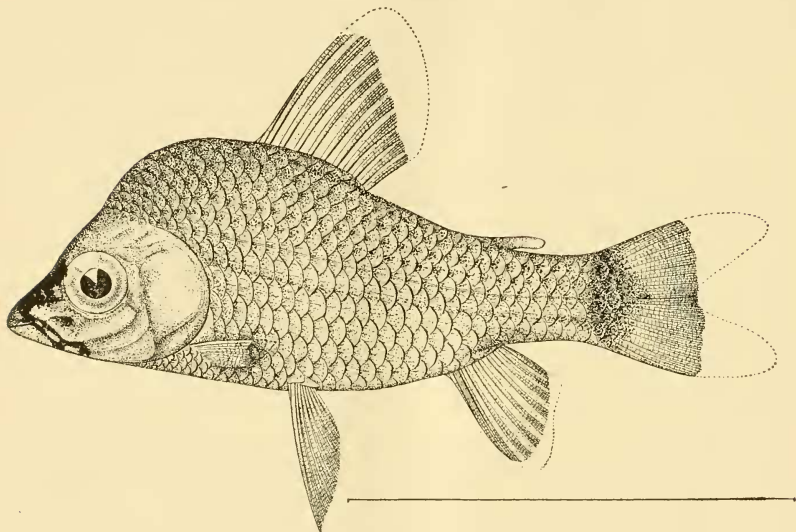


Fig. 4.—*Curimata spilura* (Günther).

the examples before me. Under *Curimatus spilurus* these writers state that the predorsal region is depressed or grooved till near the dorsal fin. This I am unable to determine.

STEINDACHNERINA subgen. nov.

Type *Curimatus trachystethus* Cope.

This group comprises those species of *Curimata* with the postventral region rounded, or with an obtuse median keel, and the back normal or not hunched as in *Cyphocharax*. Scales in most species finely serrate.

(Dedicated to Dr. Franz Steindachner, of the Royal Academy of

Natural Sciences of Vienna, as a slight recognition of his thoroughly excellent contributions to Ichthyology.)

*Curimata trachystethus* (Cope). Fig. 5.

*Curimatus trachystethus* Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 684. No. 21,470, A. N. S. P., type. Peruvian Amazon, probably from Pebas. Prof. J. Orton. Coll. of 1877.

Width of head  $1\frac{1}{2}$  in its length; width of mouth  $3\frac{3}{5}$ ; interorbital space  $2\frac{3}{5}$ . Body well compressed. Head convexly restricted below and broad above. Snout broad and obtuse in profile when viewed from above. Mouth broad. Jaws and lips thin. Mandibular angle very obtuse and with a little protuberance at symphysis fitting in a depression in front of upper jaw. Tongue a little narrow, median, rather

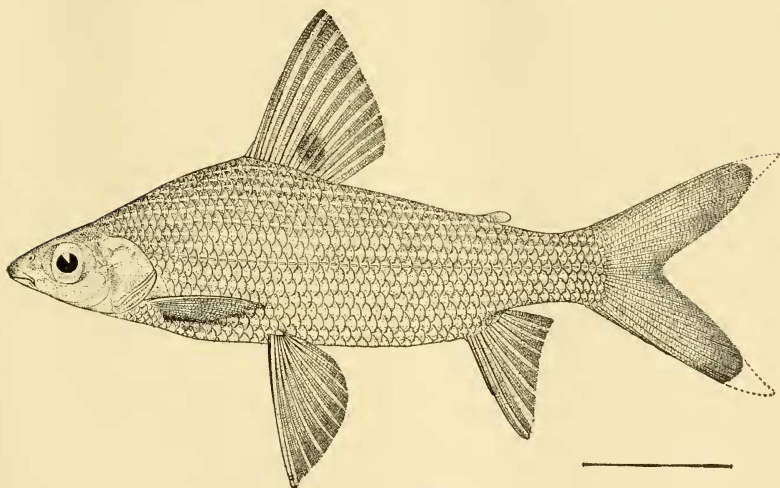


Fig. 5.—*Curimata trachystethus* (Cope).

far back, and little free in front. Interorbital space broadly convex and more or less flattened medianly. Gill-opening large and extending forward till about opposite posterior margin of pupil. No rakers. Filaments a trifle more than half of orbit. Isthmus rather broadly triangular. A short pointed scaly flap in axil of pectoral. Predorsal region with a median rounded keel. Postdorsal region rounded. Pre-ventral region flattened. Postventral region with a median obtuse

keel and a similar one on each side. Color at present in alcohol pale greenish-brown, due most likely to preservative. Back a little darker. Fins all plain, except dorsal, which is marked with a large blackish blotch nearer bases of median rays. Iris deep brown. Length  $4\frac{7}{8}$  inches (caudal damaged).

Cope's statements that "the depth at the front of the dorsal fin is one-third the length of the caudal" and "the length of the head is one-fourth the same" are impossible. He evidently intended to refer to the body.

**Curimata gilbert** Quoy and Gaimard.

*Curimatus gilbertii* Cope, Proc. Amer. Philos. Soc. Phila., XXXIII, 1894 (January 5), p. 93. Many examples from the Brazilian province of Rio Grande do Sul, probably at São João. H. H. Smith Coll.

All have the dark caudal spot evident, and in the larger ones it is very distinct. In some small ones it is preceded laterally and medianly by an irregular series of small blackish spots of uneven size. In others this is connected by a dusky streak, fading out anteriorly and enclosing the lateral line. In fact the species shows considerable color variation. Also a large uniformly colored example from Campos, Brazil. The proportions, etc., of all the examples range as follows: Head 3 to  $3\frac{7}{8}$ ; depth  $2\frac{3}{4}$  to 3; D. III, 9; A. III, 7, 1; scales 33 to 38 in lateral line to base of caudal and 3 or 4 continued on the latter; 6 or 7 scales, usually 6, obliquely back from origin of dorsal to lateral line; 6 scales obliquely between lateral line and origin of ventral; 14 to 16 scales before dorsal; total length of specimens ranging from  $2\frac{1}{4}$  to  $8\frac{1}{8}$  inches.

PELTAPLEURA subgen. nov.

Type *Salmo cyprinoides* Linnæus.

Scales on costal region enlarged, much larger than elsewhere on body, and converging posteriorly so as to form even series with the others.

(Πέλταγ, a small light shield, here used with reference to the scales; πλευρά, the side or rib.)

**Curimata cyprinoides** (Linnæus). Fig. 6.

*Curimatus cyprinoides* Cope, Proc. Acad. Nat. Sci. Phila., 1871 (1872), p. 258. Ambyiacu River, Equador. John Hauxwell.

Of 11 examples 4 before me have the squamation fairly perfect. They show the scales in the lateral line ranging from 45 to 48 when

counted to base of caudal, and 4 or 5 more on the latter. The figure is based on the largest of these.

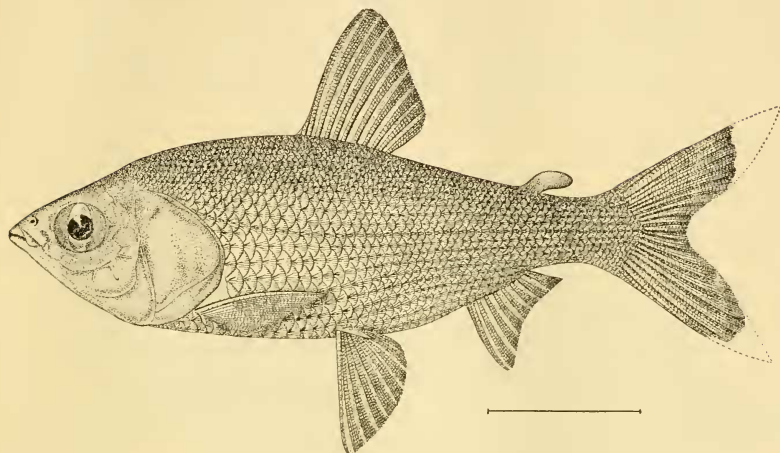


Fig. 6.—*Curimata cyprinoides* (Linnaeus).

Subgenus CURIMATA Cloquet.

Postventral region trenchant. Scales small, 51 to 70 in a lateral count, and forming more or less even longitudinal series.

In view of the uncertainty of identification of *Salmo edentulus* Bloch, which is more like the example I shall identify as *Curimata schomburgkii*, I have allowed this subgenus to fall with it and related species. Further, its identification with *Salmo cyprinoides* Linnæus may be questioned, and if any credit is attached to Bloch's figure the scales are a little large.

*Curimata copei* sp. nov. Fig. 7.

Head 3; depth  $2\frac{1}{3}$ ; D. III, 9; A. III, 9, 1; P. II, 13; V. II, 9; scales 50? in lateral line to base of caudal (squamation injured), and about 4? more on latter; about 15 scales between origin of dorsal obliquely down to lateral line; about 9 series of scales between lateral line vertically to origin of ventral; about 9 scales in a vertical series between lateral line and origin of anal; about 28 scales before dorsal; width of head  $2\frac{1}{10}$  in its length; depth of head  $2\frac{1}{3}$ ; snout  $3\frac{1}{3}$ ; eye  $3\frac{1}{4}$ ; width of mouth  $3\frac{1}{3}$ ; interorbital space  $2\frac{1}{2}$ ; base of dorsal 2; least depth of caudal peduncle  $2\frac{2}{3}$ ; base of anal 2; ventral (damaged)  $1\frac{9}{10}$ .

Body well compressed, greatest depth at origin of dorsal, and back well elevated. Upper anterior profile gibbous or convex. Edge of back rounded. Caudal peduncle compressed, its length about  $\frac{1}{2}$  in least depth.

Head rather constricted below, upper surface convex and with a nearly straight profile to occiput. Nuchal region convex. Head of rather even width. Snout broad and obtuse, especially when viewed

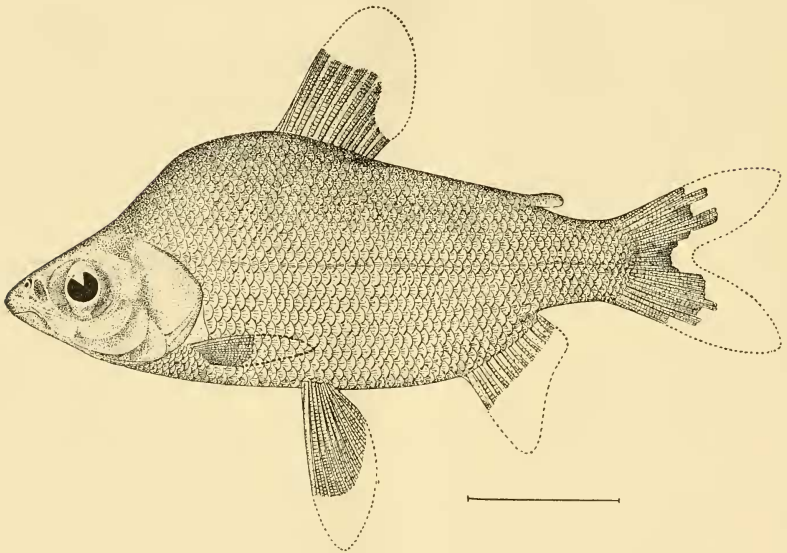


Fig. 7.—*Curimata copei* Fowler.

from above, and a little produced beyond tip of mandible. Eye large, its center near first  $\frac{2}{3}$  in length of head, and a trifle longer than deep. Adipose eyelids a little broad. Mouth broad, a little inferior, and symphysis with a little knob fitting in a depression in upper jaw. Mandibular angle broadly obtuse. Tongue thick, rounded, hardly free in front, and not broad. Nostrils adjoining, superior, a little nearer front of eye than tip of snout and posterior larger. Anterior nostril circular, and with a cutaneous margin. Interorbital space broad, a little elevated, and flattened medianly. Postorbital about equal to preorbital or about size of pupil. First infraorbital a little



more than half length of second which is long. Preopercle with several distinct flutings. Gill-flap rather narrow. Opercle smooth.

Gill-opening extending forward not quite opposite to posterior margin of pupil. Upper cleft of gill-opening extending forward a little more than at a point equal to last  $\frac{2}{3}$  in length of head. About 15 + 28? small short rudimentary filamentous-like rakers on first arch. Gill-filaments long, longest about 2 in horizontal orbital diameter. Isthmus nearly forming an equilateral triangle.

Scales moderately small, adherent, and forming longitudinal series parallel with lateral line. Scales below lateral line, or those on breast and abdominal region, a little larger than others. Scales passing over ventral carina. No narrow median naked strip from occiput to dorsal, scales passing over. Head naked. Scales on chest a little smaller than those on breast. No scales on dorsals, pectorals and ventrals. Base of caudal with scales, and along basal region of anal. Base of ventral inside with a broad flat scaly flap, and another flap, but narrow and at present equal to about  $\frac{2}{3}$  of fin (damaged), placed in axil. No flap in pectoral axilla. Lateral line of simple tubes, continuous, slightly decurved at first and then straight to caudal.

Dorsal inserted about midway in vertical between tip of snout and posterior basal margin of adipose fin. Dorsal high, first branched rays evidently highest and others graduated down. Adipose fin well developed and its base about last  $\frac{2}{3}$  in space between dorsal and base of caudal. Anal evidently low and its origin a little nearer base of caudal, in vertical, than origin of ventral. Caudal emarginate (damaged), and rays well branched. Pectoral small and low. Ventral inserted about opposite base of second branched dorsal ray, and reaching about  $\frac{2}{3}$  of distance to anal (damaged). Vent close in front of anal.

Color in alcohol brassy-brown, back with a dull olivaceous tinge. Fins all brownish. Iris deep brown.

Length  $4\frac{3}{4}$  inches.

Type, No. 8,201, A. N. S. P. Surinam. Smithsonian Institution.

One example, the type. This was long ago considered a new species by Cope. It appears to be closely related to *Curimata schomburgkii* (Günther), but differs at once in the deep body, the upper profile of which is more gibbous anteriorly.

(Named for Prof. Edward D. Cope.)

*Curimata schomburgkii* (Günther). Fig. 8.

Body well compressed. Edge of back rounded. Caudal peduncle compressed. Head compressed, a little constricted inferiorly, upper surface convex. Nuchal region also convex. Head of rather even

width. Snout broad, blunt when viewed above. Mouth broad and symphysis with a knob fitting in a cavity of upper jaw. Mandibular angle broadly obtuse. Tongue small, as usual rather far back, flattened, a little thick and only edges free. Interorbital space broad and a little

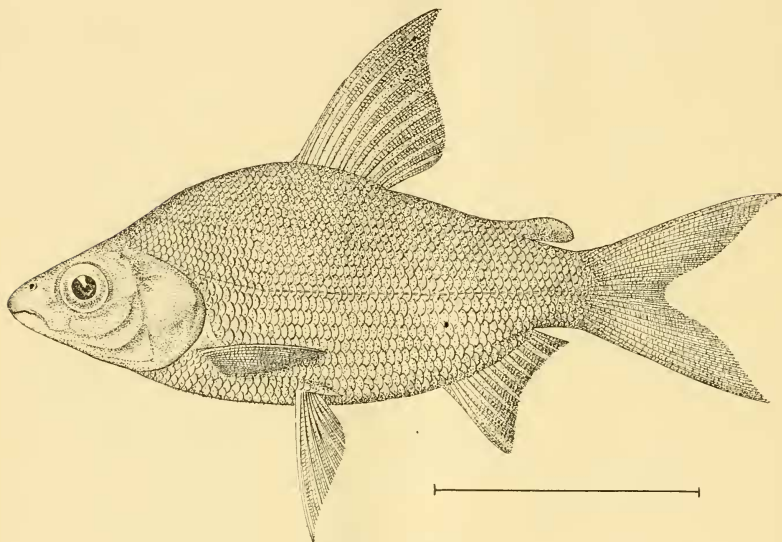


Fig. 8.—*Curimata schomburgkii* (Günther).

elevated convexly, not especially flattened medianly. Gill-opening forward till not quite opposite posterior margin of pupil. Upper cleft of gill-opening extending forward  $\frac{2}{3}$  in length of head. Gill-rakers  $10? + 32?$ , small short rudimentary-like weak filaments. Gill-filaments about 2 in eye. Isthmus a little broad and triangular. Scales more or less adherent, passing over ventral keel and ridge before dorsal. Scales on chest a little smaller than those on breast. Base of ventral inside with a broad scaly flap. Vent close to anal. Color in alcohol brassy-brown. Length  $4\frac{3}{4}$  inches (caudal damaged).

Two examples from Surinam, larger described above. Dr. Hering. The smaller example is in better preservation. It shows: Head  $2\frac{1}{4}$ ; depth  $2\frac{3}{8}$ ; D. III, 8; A. III, 9, 1; scales 54 in lateral line to base of caudal, and 4 more on latter; snout  $3\frac{3}{8}$  in head; eye  $3\frac{3}{8}$ ; pectoral  $1\frac{3}{8}$ ; ventral

$1\frac{3}{5}$ ; upper caudal lobe about 1. Rakers distinct. First branched ray of dorsal longest, and reaching well beyond others, when fin is depressed, or to origin of adipose fin. Adipose fin long, its length along posterior margin but little less than length of its base. Anterior anal rays elevated. Caudal long, deeply forked, and each lobe well pointed. Pectoral long, pointed, and reaching origin of ventral. Ventral long and pointed, and reaching origin of anal.

**Semitapicus laticeps** (Valenciennes).

*Curimatus altamazonicus* Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 684. Nos. 21,118 (type) to 21,120, A. N. S. P., cotypes. Peruvian Amazon. Prof. J. Orton. Coll. of 1873.

Head  $3\frac{3}{5}$ ; depth  $2\frac{3}{4}$ ; D. II, 9, 1; A. III, 12, 1; P. I, 16; V. II, 8; scales about 88 in lateral line to base of caudal (squamation injured), and 6 more on latter; width of head  $2\frac{1}{8}$  in its length; depth of head  $1\frac{3}{5}$ ; snout  $3\frac{3}{4}$ ; width of mouth  $3\frac{3}{4}$ ; interorbital space  $2\frac{2}{3}$ ; base of dorsal  $2\frac{1}{10}$ ; base of anal 2; least depth of caudal peduncle 3; pectoral (damaged) 2; ventral (damaged)  $1\frac{1}{5}$ . No gill-rakers, and filaments  $1\frac{1}{5}$  in eye. Color in alcohol brown, paler on lower surface or below lateral line. Head dark on top, like back, and sides and under portions pale. Fins all brownish. Eye dusky. Length (caudal damaged)  $7\frac{3}{4}$  inches. Type.

The other cotypes show: Head 3 and  $3\frac{1}{10}$ ; depth  $2\frac{5}{6}$ ; D. II, 10, 1; A. II, 13, 1; total length of body  $6\frac{1}{4}$  and  $7\frac{1}{8}$  inches respectively (caudals damaged).

**Psectrogaster oliatus** (Müller and Troschel).

*Curimatus rutiloides* Cope, Proc. Acad. Nat. Sci. Phila., 1871 (1872), p. 258. Ambyiacu River, Equador. John Hauxwell. (Not of Kner.)  
*Curimatus cyprinoides* Cope, *l.c.*, p. 291. Between the mouth of the Rio Negro and the Peruvian Amazon or Ucayale River. Robert Perkins. (Not of Linnæus.)

Head 3; depth  $2\frac{1}{3}$ ; D. III, 9, 1; A. III, 7, 1; scales 48 in lateral line to base of caudal, and 5 more on latter; 12 scales in an oblique series back from origin of dorsal to lateral line; 9 series of scales obliquely back from origin of ventral to lateral line; 9 series of scales obliquely forward from origin of ventral to lateral line; about 32 scales before dorsal; snout  $3\frac{1}{5}$  in head; eye  $3\frac{1}{4}$ ; width of mouth  $3\frac{3}{4}$ ; interorbital space  $2\frac{2}{5}$ ; pectoral  $1\frac{3}{5}$ ; ventral  $1\frac{3}{5}$ ; least depth of caudal peduncle  $2\frac{7}{8}$ . Rakers none. Gill-filaments about  $\frac{1}{5}$  of orbit. Postventral carina well developed, scales strongly pectinate which form it. Scales on body all more or less ctenoid. Upper and lower profiles of body more or less evenly convex. Scales on trunk enlarged anteriorly on middle of side, so that longitudinal series are formed which are more or less parallel with course of lateral line above, and below converging as they

approach caudal. In alcohol brassy-brown with more or less silvery. Back till about level with occiput a dull olive-brown. Upper surface of head brownish. Body mostly washed with silvery. Fins plain brown, and pale like side. Iris brown. Length  $5\frac{1}{4}$  inches. This is the largest example. It is from between the mouth of the Rio Negro and the Peruvian Amazon. Robert Perkins. Also another example with same data. These are labelled, evidently in Cope's handwriting, as "*Curimatus cyprinoides v. aff.*"

Besides the above are 5 examples from the Ambyiacu river in the Hauxwell collection. Cope's label reads "*Curimatus rutiloides.*" An examination of the air-vessels of two of these examples shows that it persists nearly as far posteriorly till opposite base of penultimate anal ray. It is thus apparent that Cope may have intended all the examples before me to represent his *C. rutiloides*, but the original labels in his own handwriting would lead to the above allocating of the references. The form called *Psectrogaster amazonica* by Dr. and Mrs. Eigenmann I cannot distinguish in my examples.

**Potamorhina pristigaster** (Steindachner).

Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 685. Peruvian Amazon, probably from Nauta. Prof. J. Orton. Coll. of 1873.

Head 3; depth 2 to  $2\frac{1}{4}$ , a little larger in smaller specimen; D. III, 9; A. III, 11 to III, 13, 1; ventral scutes 22 to 28; scales (squamation damaged) about 90 in lateral line to base of caudal and several more on latter; snout  $3\frac{1}{2}$  to  $3\frac{2}{3}$  in head; eye  $4\frac{1}{2}$  to  $4\frac{1}{4}$ ; width of mouth  $3\frac{1}{2}$  to  $3\frac{1}{4}$ ; interorbital space  $2\frac{3}{4}$  to  $2\frac{2}{3}$ ; total length of 3 examples 6 to 9 inches (caudal damaged).

**Anodus elongatus** Agassiz. Fig. 9.

*Anodus steatops* Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 683. Nos. 21,498 (type) and 21,499, A. N. S. P., cotypes. Pebas. Prof. J. Orton. Coll. of 1877.

Body rather plump. Head broadly convex above, a little restricted below. Snout when viewed above rather rounded. Edges of jaws not sharp. Lips thin. Rami of mandible well elevated inside mouth. Tongue large, elongate, flattened above, rounded in front and free. Inside mouth upper membrane broad. Interorbital space broadly convex. Gill-opening extending forward to front margin of orbit. Rakers 66? + 100?, long, slender, or very fine and numerous and longest equal to  $1\frac{1}{4}$  eye-diameters. On inner edge of first branchial arch also a series shorter in length. Longest filaments nearly equal orbit. Isthmus long, narrow and slender. A triangular naked space extending back on occiput. Edges of body rounded except those of lateral

line. Vent close in front of anal. Color in alcohol dull olive-brown, darker on back, and top of head deep brownish. Fins dull greenish, bases of caudal lobes blackish. A brownish or dusky blotch on several scales about and in lateral line about opposite tip of depressed dorsal. Greenish tints all probably due to the preservative. Iris and adipose eyelid brownish. Length (caudal damaged)  $10\frac{1}{2}$  inches. Type.

In explanation of Cope's remarks it may be stated that these fishes

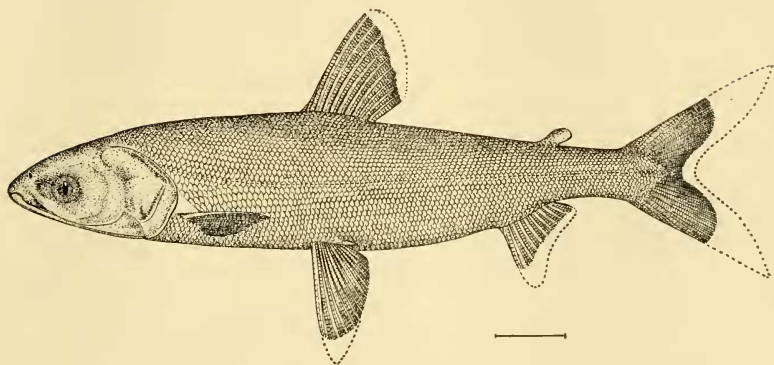


Fig. 9.—*Anodus elongatus* Agassiz.

agree best with *Anodus elongatus* Agassiz, a species from which I am unable to separate it. The pectorals and ventrals, although damaged, reach more than half the distance credited. The ventrals are more anterior in position, or originate under the anterior portion of the dorsal, and not opposite its middle.

**EIGENMANNINA** gen. nov.

Type *Anodus melanopogon* Cope.

Head large, especially opercular apparatus, and upper profile strongly concave. Mandible well produced beyond tip of upper jaw so that mouth is superior. Eye above middle in depth of head. Body heavy anteriorly, and tapering towards caudal. In other respects more or less allied to *Anodus*.

(Named for Dr. Carl H. Eigenmann, of the Chair of Zoology in Indiana University, a well-known authority on South American fishes.)

***Eigenmannina melanopogon*** (Cope). Fig. 10.

*Anodus melanopogon* Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 682. Nos. 21,227 (type) to 21,232, A. N. S. P., cotypes. Peruvian Amazon. Prof. J. Orton. Coll. of 1873.

Width of head  $3\frac{1}{2}$  in its length; interorbital space  $4\frac{1}{7}$ . Body, head and caudal peduncle compressed. Upper surface of head narrow, convex, and lower surface constricted. Snout rounded and convex when seen from above. Jaws more or less flattened or spatulate. Each ramus of mandible well elevated inside of mouth. Lips hardly developed or very thin. Tongue small, narrow, rather thick, fleshy,

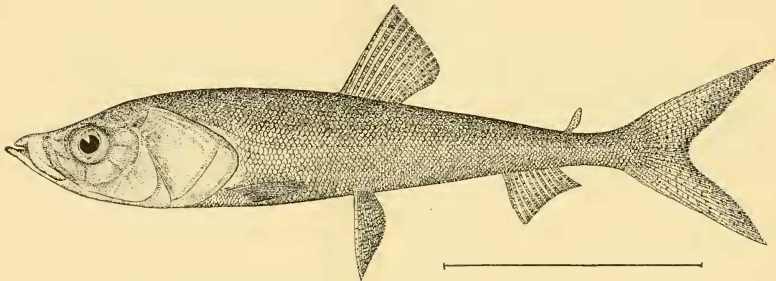


Fig. 10.—*Eigenmannina melanopogon* (Cope).

and united with floor of mouth by a median fleshy frenum. Upper buccal membrane rather narrow. Interorbital space a little elevated convexly and flattened medianly. Gill-opening large, extending forward till a little before front rim of orbit. Vent close in front of anal. Color in alcohol more or less silvery, back brown fading to white on sides and under surface. Top of head brown, sides and lower surface silvered white. Fins pale brownish, dorsal and caudal a trifle darker, and each ray of most fins speckled or spotted rather indistinctly with darker brownish. Iris rather brassy. Length  $2\frac{7}{8}$  inches (caudal damaged). Type.

One example shows 35? + 54? slender rakers, and longest about equals eye or much longer than filaments.

With reference to the original description, Cope evidently intended to state that the base of the first dorsal ray was three millimeters nearer the end of the muzzle than the base of the caudal. Both pectorals and ventrals reach more than half way in the spaces stated. Cope evidently counts 128 rows of scales from the occipital region, and those on base of caudal. The origin of the ventral is below the bases of



the anterior dorsal rays. Most of rays of the fins are specked with brownish.

This species is related to *Eigenmannina orinocensis* (Steindachner), but differs in the fewer scales, absence of the dark median lateral blotch and the coloration of the caudal.

CHILOMYZON subgen. nov.

Type *Prochilodus steindachneri* sp. nov.

Scales large, less than 40, usually between 33 and 38 in a lateral count. Mouth disk-like and inferior. Related to *Prochilodus* Agassiz. (*Χεῖλος*, lip; *μύζω*, to suck.)

*Prochilodus steindachneri* sp. nov. Fig. 11.

Head  $3\frac{1}{2}$ ; depth  $2\frac{2}{5}$ ; D. III, 9, I; A. III, 8, I; P. I, 14; V. I, 8; scales 34 in lateral line to base of caudal and 3 more on latter; about 14 scales

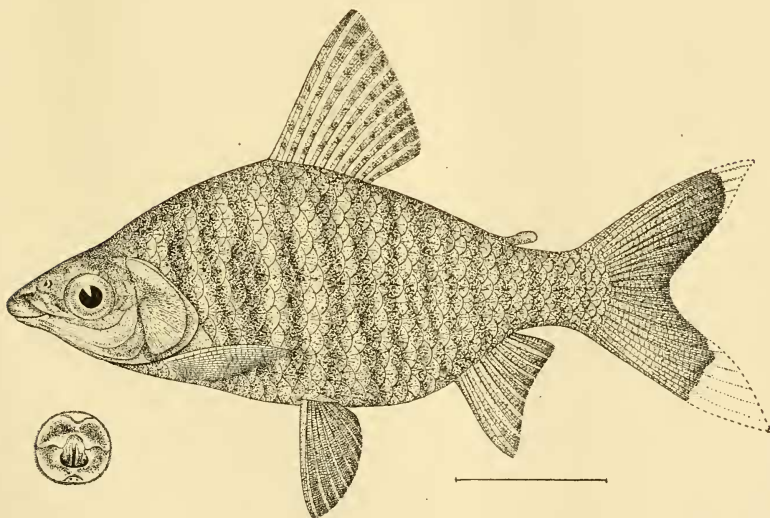


Fig. 11.—*Prochilodus steindachneri* Fowler.

before dorsal; 7 scales obliquely back from origin of dorsal to lateral line; 6 scales obliquely forward from origin of ventral to lateral line, and same number in similar count from origin of anal; about 16 scales from isthmus to origin of ventral; 3 scales obliquely back from origin

of adipose fin to lateral line; width of head  $1\frac{7}{8}$  in its length; depth of head  $1\frac{1}{2}$ ; snout  $3\frac{3}{4}$ ; eye  $3\frac{1}{5}$ ; width of mouth  $2\frac{2}{5}$ ; interorbital space  $2\frac{1}{10}$ ; third dorsal ray  $1\frac{1}{2}$ ; third anal ray 2; length of pectoral  $1\frac{2}{3}$ ; of ventral  $1\frac{1}{2}$ ; least depth of caudal peduncle  $2\frac{1}{2}$ .

Body deep, compressed, rhomboid in shape, and suggesting certain *Cyprinidæ*. Upper profile more or less evenly convex, back elevated, and greatest depth at origin of dorsal. Lower profile at first straight for a good distance, and becoming convex posteriorly. Caudal peduncle compressed, short, and its least depth about equals its length.

Head small, compressed or restricted a little below, and upper surface broadly rounded. Lower surface of head also flattened. Snout broad, obtuse, fleshy, and produced well beyond tip of mandible. Eye circular, a trifle anterior, and above center in depth of head. Eyelid narrow. Mouth broad, and in profile of gape curved downwards. When opened mouth is broad, directed inferiorly, and jaws furnished with broad thick and fleshy lips formed somewhat as a disk. Margin of this disk with a single series of small weak or movable ciliiform teeth. In front of each jaw behind outer series a short second or inner series of similar ones, convex or angular in its course, and with bend or angle directed inwards. Aperture of mouth small. Tongue small, hardly free from floor of mouth. Nostrils close together on side of snout above, and much nearer upper front rim of orbit than tip of upper jaw. Anterior nostril circular, with its posterior cutaneous margin more or less concealing posterior which is thus lunate. Interorbital space broad and convex. Infraorbital rim narrow, lowest or most posterior largest. Preorbital a little swollen, with a deep cavity and large thick lip and maxillary more or less filling it when mouth is closed. Opercle striate. Opercular flap broad and rather cutaneous.

Gill-opening extending forward till nearly opposite posterior margin of orbit. Rakers none. Filaments of inner series a little longer than those in outer, or about equal to  $\frac{4}{5}$  of orbital diameter. Isthmus broad. Branchiostegals long, broad, subequal, and 4 on each arch.

Scales large, of more or less even size, disposed in longitudinal series parallel with lateral line, and each one with several striæ. Margin of each scale also a little rough. Small scales on bases of caudal and anal, otherwise fins and head naked. A pointed scaly flap in axil of ventral equal to about  $\frac{1}{3}$  of length of ventral. Both predorsal and postdorsal regions with a median keel, former most distinct, and latter also extending on upper surface of caudal peduncle behind adipose fin though still less distinct. Behind first dorsal also an indistinct lateral keel on each side, and below and posterior to adipose fin they are also

evident. Preventral region keeled in similar manner to postdorsal, only median keel most pronounced. Postventral and postanal region keeled, former may be considered almost trenchant. Lateral line continuous, of simple tubes, a little above middle in depth of body and continuous to caudal.

Dorsal high, third ray longest, and origin of fin would fall in vertical about midway between tip of snout and base of adipose fin. Anal small, anterior rays longest, margin of fin concave, and its origin nearer base of caudal than origin of ventral. Adipose dorsal small, its base inserted about opposite bases of last anal rays. Caudal long, deeply emarginate and end of each lobe apparently more or less pointed. Pectoral rather long, pointed, and extending beyond origin of dorsal or about  $\frac{2}{3}$  of space to ventral. Ventral inserted nearly opposite middle of base of dorsal or about midway between origin of anal and that of pectoral, and extending about  $\frac{3}{4}$  of distance to former. Vent close in front of anal fin.

Color in alcohol more or less pale brownish washed with silvery-purplish. Back a little darker than side and lower surface. Body also with about fifteen or more indistinct vertical or transverse purplish-dusky bands. Dorsal with about six series of brownish spots on rays. Other fins pale plain brownish. Iris brassy.

Length 5 inches.

Type, No. 8,207, A. N. S. P. Parahyba, Brazil. Museum of Comparative Zoology, Cambridge, Mass. Only one example, the type.

This species is closely related to *Prochilodus corimbata* (Kner) = *Salmo corimbata* Natterer, in Kner = *P. nigricans* Kner, nec Agassiz = *P. oligolepis* Günther. Dr. Steindachner's account of the last does not give the coloration. Other related species are *P. humeralis* Günther and *P. vimboides* Kner, both differing in proportions, etc.

(Named for Dr. Franz Steindachner.)

Subgenus PROCHILODUS Agassiz.

Scales small, more than 40 or usually between 40 and 60 in a lateral count. Mouth similar to that of *Chilomyzon*.

*Prochilodus ortonianus* Cope. Fig. 12.

Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 685. No. 21,267 (type), A. N. S. P., cotype. Nauta, Peru. Prof. J. Orton. Coll. of 1873.

Width of head  $1\frac{1}{2}$  in its length; width of mouth  $2\frac{2}{3}$ ; interorbital space 2. Body robust, compressed, and caudal peduncle similar. Head broad, robust, convex on upper surface, and lower surface but little restricted

though more evenly convex. Width of head more or less even. Snout broad, convex above and broadly rounded when viewed from above. Interorbital space convex and median narrow fontanel extending from internasal space to occiput. Head with arborescent mucous canals on upper side posteriorly and on suborbital region. Gill-opening falling a trifle short of posterior margin of orbit. Rakers none. Gill-filaments about  $1\frac{1}{2}$  in eye. Isthmus broad. Branchiostegals 4, large, well developed and subequal. Scales a little rough and each one

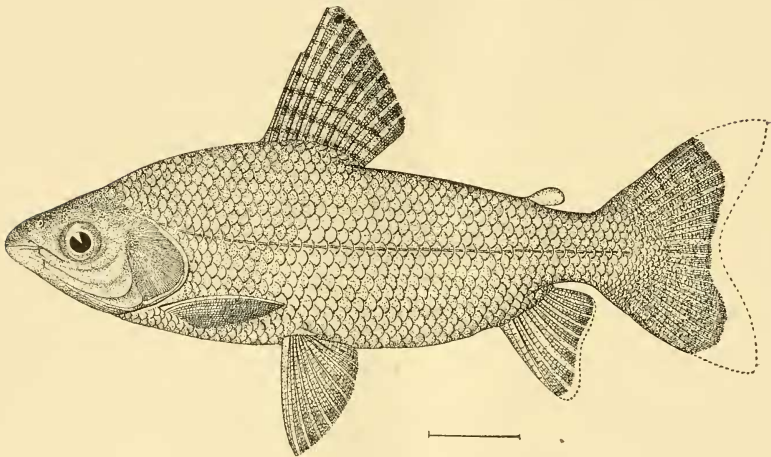


Fig. 12.—*Prochilodus ortonianus* Cope.

with several striae. Predorsal region slightly keeled. Postdorsal region rounded. Upper and lower surfaces of caudal peduncle a little flattened. Preventral region flattened medianly. Postventral region sharply keeled medianly and an obsolete keel on each side, all three converging towards vent. Color in alcohol at present dull olivaceous or brassy-brown, back with more or less dull metallic shades. Fins all pale brownish, dorsal and caudal each with about 8 series of brownish spots on each ray of former, and about 6 on each lobe of caudal, so that on latter they form more or less transverse bands. Iris brownish. Length  $7\frac{3}{4}$  inches. Type.

*Prochilodus cephalotes* Cope. Fig. 13.

Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 686. No. 21,211, A. N. S. P., type. Peruvian Amazon. Prof. J. Orton. Coll. of 1873.

Width of head  $1\frac{1}{2}$  in its length; width of mouth  $2\frac{1}{2}$ ; interorbital space

2. Width of head greatest in postero-supraocular region. Gill-filaments about  $\frac{3}{4}$  of orbit. Predorsal region apparently keeled. Pre-ventral region apparently rounded, and postventral region keeled. Color in alcohol more or less pale plumbeous and somewhat silvered. Back darker or dusky-plumbeous. Upper surface of head like back,

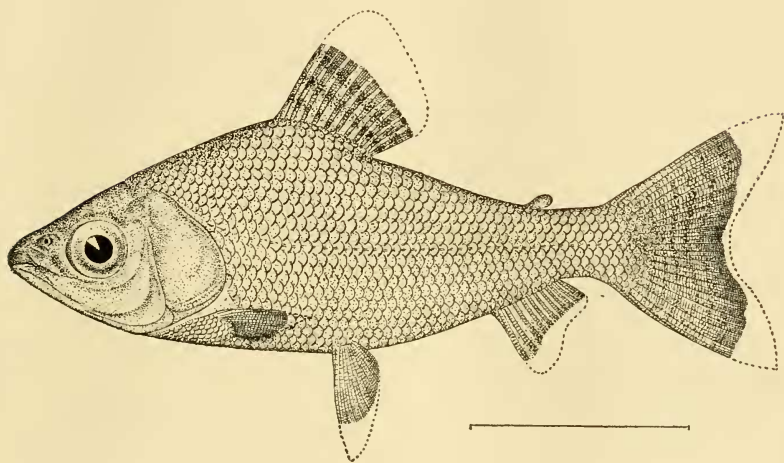


Fig. 13.—*Prochilodus cephalotes* Cope.

and lower surface like that of belly. Damaged dorsal with at least 4 series of deep brownish spots on rays. Caudal also with transverse series of spots, other fins plain. Iris brassy. Length  $2\frac{3}{4}$  inches. Otherwise like the preceding.

*Prochilodus theraponura* sp. nov. Fig. 14.

*Prochilodus insignis* Cope, Proc. Acad. Nat. Sci. Phila., 1871 (January 16, 1872), p. 258. Ambyiacu River, Equador. John Hauxwell.

Head  $2\frac{1}{2}$ ; depth  $2\frac{1}{4}$ ; D. III, 9; A. III, 8, 1; P. II, 11?; V. II, 8; scales about 40? (squamation damaged), and 5? more evidently on base of caudal; about 10? scales obliquely back from origin of dorsal to lateral line; about 8? scales obliquely forward from origin of anal to lateral line; 14 scales before dorsal; width of head about 2 in its length; depth of head  $1\frac{1}{2}$ ; snout  $3\frac{1}{2}$ ; eye 3; width of mouth 3; interorbital space  $2\frac{1}{5}$ ; length of first branched dorsal ray  $1\frac{1}{4}$ ; base of dorsal  $2\frac{1}{10}$ ; base of anal  $2\frac{1}{5}$ ; length of upper caudal lobe 1; pectoral  $1\frac{3}{5}$ ; ventral  $1\frac{2}{5}$ ; least depth of caudal peduncle  $3\frac{1}{2}$ .

Body robust, compressed, back but little elevated so that upper profile would form an obtuse angle at origin of dorsal, and lower profile more or less evenly convex. Greatest depth at origin of dorsal. Caudal peduncle compressed, and its length about  $\frac{3}{4}$  its least depth.

Head compressed, convex on upper surface, and sides constricted below. Greatest width in postero-supraocular region, and upper profile nearly straight or only a trifle concave. Snout short, convex, rather broad, and rounded when viewed from above. Eye circular,

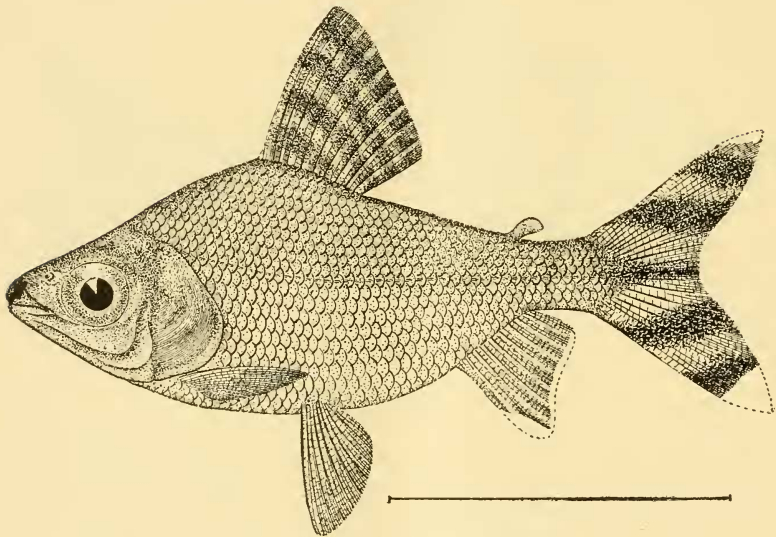


Fig. 14.—*Prochilodus theraponura* Fowler.

anterior, and a trifle above middle of depth. Eyelid narrow. Jaws even, a little broad, and together with mouth and nostrils like in preceding species of *Prochilodus*. Interorbital space convex, and median fontanel extending from internasal region to occiput, broader. Post-orbital largest in suborbital rim. Mucous channels on cranium laterally not pronounced. Opercle with indistinct curved transverse striae. Gill-flap apparently narrow.

Gill-opening extending forward a little in advance of posterior margin of orbit. Rakers none. Gill-filaments equal, about  $\frac{3}{4}$  length of orbit.



Isthmus a little narrowly compressed. Branchiostegals 4, large and subequal.

Scales mostly fallen, little rough, apparently disposed in even longitudinal series parallel with lateral line, each one with one or more striae, and apparently of more or less even size. Small scales apparently along bases of dorsal and anal, and on that of caudal. No trace of ventral flap remains. Predorsal region keeled. Postdorsal region rounded. Upper and lower surfaces of caudal peduncle, pre-ventral and postventral regions keeled. Lateral line (damaged) continuous, on base of caudal, nearly straight, more or less median, and of simple tubes.

Origin of dorsal about midway between tip of snout and base of adipose fin, first branched ray longest, and others apparently graduated down. Adipose fin with base over those of last anal rays. Origin of anal much nearer base of caudal than origin of ventral, or nearly midway between base of last dorsal ray and that of caudal, and anterior rays apparently longest. Pectoral low, rather long, and reaching ventral. Ventral with origin a trifle in advance of middle of base of dorsal, and reaching nearly  $\frac{3}{4}$  of space to anal. Vent close in front of anal.

Color in alcohol pale plumbeous, sides and lower surface more or less silvered, and back dusky-plumbeous. Upper surface of head dusky-plumbeous, sides and lower surface silvered. Fins all pale brownish. Dorsal with four well-defined broad deep brown cross-bands. Caudal with two similar colored oblique bands on each lobe, and a median or horizontal one from base of fin to tips of middle rays. Anal with lower anterior tip of fin brownish, and another horizontal transverse band from origin of fin to tips of more posterior rays also of brownish. Pectoral and ventral apparently plain pale brownish. Iris dull brownish.

Length  $2\frac{1}{4}$  inches.

Type, No. S,033, A. N. S. P. Ambyiacu River, Equador. John Hauxwell. Only one example.

Formerly identified by Cope with *Prochilodus insignis* Kner, this species may at least provisionally be regarded as distinct. This is in view of the identity of *Prochilodus insignis* Jardine and *P. insignis* of Kner, and later of Dr. Günther, not yet having been proved. Schomburgk's figure, as presented by Jardine, shows each lobe of the caudal with five oblique bands besides the median one, which is also in agreement in the description. Dr. Günther's Amazon examples are said to have only three or four bands across each lobe besides the median one.

*Prochilodus theraponura* may thus be said to differ from all of the others in the fact that it has but two oblique dark bars on the caudal, aside from the median one.

(*Θεράπων*, servant, with reference to the caudal bands, like those of *Therapon*; *ὄρα*, tail.)

*Prochilodus amazonensis* sp. nov. Fig. 15.

Head  $3\frac{3}{8}$ ; depth  $2\frac{2}{7}$ ; D. III, 9, 1; A. III, 8, 1; P. I, 16; V. I, 8; scales about 43 in lateral line to base of caudal, and 5 more on latter; 11 scales obliquely back from origin of dorsal to lateral line; 8 scales obliquely forward up from origin of anal to lateral line; 10 scales obliquely up from origin of ventral to lateral line; 15 scales before dorsal; width of head  $1\frac{3}{8}$  in its length; depth of head  $1\frac{1}{8}$ ; snout 3; eye  $3\frac{3}{8}$ ; maxillary  $3\frac{1}{10}$ ;

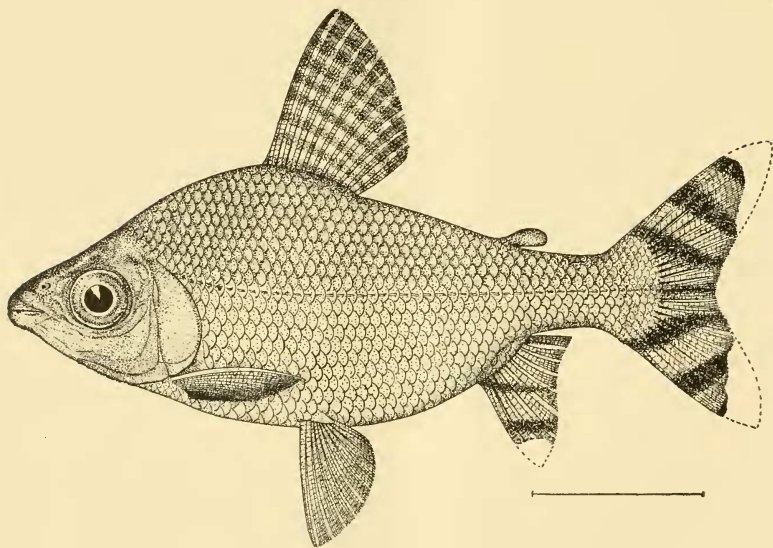


Fig. 15.—*Prochilodus amazonensis* Fowler.

width of mouth  $2\frac{3}{7}$ ; interorbital space 2; length of base of dorsal  $1\frac{1}{8}$ ; length of base of anal  $2\frac{1}{4}$ ; length of pectoral  $1\frac{3}{8}$ ; ventral (damaged)  $1\frac{1}{2}$ , least depth of caudal peduncle  $2\frac{1}{2}$ .

Body rather deep, compressed, back but little elevated so that upper profile would form a rather obtuse angle at origin of dorsal, at which

point is also greatest depth. Lower profile more or less evenly convex. Caudal peduncle compressed, and its length equals about  $\frac{2}{3}$  its least depth.

Head robust, broad and convex on upper surface with profile nearly straight or only very slightly concave, and lower surface but little restricted, though more evenly convex. Width of head more or less even. Snout broad, rather short, convex above, and broadly rounded when seen from above. Eye circular, anterior, and a little above middle in depth of head. Eyelid narrow. Jaws broad, rounded, almost even or upper a trifle produced. Lips thick and fleshy, and teeth as in preceding species. Upper buccal flap broad and with a median fleshy tubercle in front. Lower buccal flap broad. Tongue and nostrils as in preceding species. Interorbital space also similar, and fontanel rather narrow. Postorbitals largest in suborbital chain. Cranium and suborbitals with mucous canals, some arborescent. Opercles with traces of very faint radiating striæ. Gill-flap narrow.

Gill-opening extending forward till nearly opposite posterior margin of pupil. Rakers in form of 4? + 8? or more short inconspicuous fleshy points along outer edge of first branchial arch. Filaments long, series on inner edge of first arch longer, equalling about  $\frac{3}{4}$  of orbital diameter. Isthmus broad. Branchiostegals 4, large, well developed and subequal.

Scales rather small, striate, rather smooth, in even longitudinal or horizontal series parallel with lateral line, and of more or less even size. Small scales along bases of dorsal and anal and on that of caudal. Ventral with a rather short pointed scaly flap about  $\frac{1}{3}$  length of (damaged) fin. Predorsal region with a median keel. Postdorsal region rounded. Upper and lower surfaces of caudal peduncle flattened. Preventral region flattened posteriorly, and with a low or obsolete keel anteriorly. Postventral region trenchant and with an obsolete keel on each side, convergent posteriorly. Lateral line continuous, median on side, extending on base of caudal, decurved a little in front, and mostly of simple tubes except those on first 6 scales which are arborescent.

Origin of dorsal falling in vertical about midway between tip of snout and origin of adipose fin, rays long, first branched one apparently highest, and others graduated down so that last one is less than half length of first. Adipose dorsal small, its base over bases of posterior anal rays. Anal inserted nearly midway between base of last dorsal ray and base of caudal, anterior rays longest and edge of fin a little concave. Caudal emarginate, lobes apparently broad. Pectoral low,

pointed or upper rays longest, and reaching ventral. Ventral inserted about opposite first third of base of dorsal. Vent close in front of anal.

Color in alcohol pale or dull brownish more or less silvered or with brassy reflections. Back with pale or dull purplish reflections becoming very dilute greenish on sides. Each scale more or less paler on outer or exposed portion, so that rather pale longitudinal lines are formed on back. Upper surface of head brownish, sides and lower surface silvered. Fins all pale brownish, dorsal with about eight dusky cross-bands. Caudal with a median blackish band from center of its base to tips of median rays, and each lobe with three oblique bands of similar color, but broader anteriorly. Anal with three horizontal dusky bands, lowest near tips of anterior rays, median beginning at origin of fin, and upper at posterior rays. Pectoral and ventral plain. Iris brownish.

Length  $4\frac{3}{8}$  inches.

Type, No. 21,350, A. N. S. P. Lower Amazons. Prof. J. Orton. Coll. of 1874. Prof. E. D. Cope. One example.

This species is also apparently closely related to *Prochilodus insignis* Jardine, but differs in the fewer blackish bars on the caudal lobes. It will possibly prove identical with the examples recorded by Dr. Günther which have three dark bars on each caudal lobe.

(Named for the Amazon river of South America, also written Amazons and Amazonas. The name Amazon is said to be derived from the Indian word Amassona or "boat-destroyer," with reference to the destructive tidal phenomenon or proroca.)

HEMIODOPSIS subgen. nov.

Type *Hemiodus microlepis* Kner.'

This group is distinguished from subgenus *Hemiodus* Müller and Troschel by the small scales in a lateral count, at least 100 or more.

(*Hμῖ*, half; *ὀδὸς*, tooth; *ῥψις*, appearance, with reference to the subgenus *Hemiodus*.)

**Hemiodus microlepis** Kner.

Cope, Proc. Acad. Nat. Sci. Phila., 1871 (1872), p. 291. Between the mouth of the Rio Negro and the Peruvian Amazon. Robert Perkins.—

Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 686. Peruvian Amazon. Prof. J. Orton.

Head 4; depth  $3\frac{9}{10}$ ; D. III, 9, 1; A. III, 9, 1; scales about 105 (squamation injured) in lateral line to base of caudal, and 7 more on latter; about 24? scales obliquely back from origin of dorsal to lateral line; about 12? scales between lateral line and origin of ventral, and about same number between former and origin of anal; snout  $3\frac{1}{4}$  in head; eye

$4\frac{2}{5}$ ; interorbital space 3; pectoral  $1\frac{1}{2}$ ; ventral  $1\frac{1}{8}$ ; least depth of caudal peduncle  $2\frac{4}{7}$ . Eye midway in depth of head. Gill-opening extending forward till about opposite middle of orbit. Rakers  $22? + 38?$ , compressed, cuneated triangularly, and inner edge of each ciliate. Gill-filaments about equal to  $\frac{1}{3}$  of orbital diameter. Scales above pectoral anteriorly, both above and below lateral line, and on breast, enlarged. Scales on base of caudal also a little large. Scales on post-dorsal region of back formed into more or less convergent series and larger than those just below. Lower lobe of caudal much longer than upper, just the reverse of that indicated by Kner. Length 9 inches (caudal damaged). One example from Robert Perkins, taken between the mouth of the Rio Negro and the Peruvian Amazon.

Also two smaller examples from the Peruvian Amazon. Prof. J. Orton. Coll. 1873 and 1877. Prof. E. D. Cope. These both show about 120 scales in lateral line to base of caudal, and 7 or 8 more on latter. Middle of lower lobe of caudal dusky longitudinally, and deepest basally. The Perkins example shows this as faint.

#### CITHARININÆ.

*Citharinus citharus* (Geoffroy St. Hilaire).

*Citharinus geoffroyi* Günther, Proc. Zool. Soc. London, 1896 (February 4), p. 223. Lake Rudolf. Dr. A. D. Smith.

Head  $2\frac{5}{6}$ ; depth  $2\frac{1}{3}$ ; D. iv, 14, 1; A. v, 24, 1; scales 83 in lateral line to base of caudal, and 5 more on latter; 21 scales in a vertical series between origin of dorsal and lateral line; 17 scales between origin of anal and lateral line in a vertical series; snout  $4\frac{1}{2}$  in head; eye  $3\frac{1}{2}$ ; width of mouth 3; interorbital space 3; base of dorsal  $1\frac{1}{3}$ ; base of anal  $1\frac{1}{3}$ ; least depth of caudal peduncle  $3\frac{2}{3}$ ; pectoral  $1\frac{1}{2}$ ; ventral  $1\frac{1}{2}$ . Back rather elevated, profile forming an angle at origin of dorsal. Lower profile of body more or less evenly convex. Head becoming compressed below. Snout short and broad. Eye about circular. Interorbital space broad and a trifle convex. Gill-rakers not evident. Color in alcohol, back brownish from a little above lateral line, and lower surface and side silvery-white. Fins pale brownish. Iris pale straw-color. Length  $2\frac{3}{4}$  inches. Two examples, the other a little smaller. They both differ from the original figure of Geoffroy St. Hilaire in the straight upper anterior profile.

PITHECOCHARACINÆ subfam. nom. nov.

(*Anostomina* Auct.)

**PITHECOCHARAX** gen. nov.

Type *Salmo anostomus* Linnæus.

Snout narrow and conic, and mouth superior.

This name is proposed as *Anostomus* Klein, in Walbaum, *Pet. Arted. Gen. Pisc.*, III, 1792, p. 659 (type *Salmo anostomus* Linnæus) = Gray, *Cat. Brit. Mus. Fish. Gron.*, 1854, p. 153, is preoccupied in Ornithology by *Anastomus* Bonnaterre, *Enc. Méth. Ornith.*, 1790, p. xciii.

(*Ἄνωστος*, ape, with reference to the short snout or nose; *χαράξ*, Charax.)

**Pithecocharax trimaculatus** (Kner).

*Schizodon trimaculatus* Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 690. Peruvian Amazon. Prof. James Orton. Coll. of 1877.

Head 4; depth 3; D. II, 10, 1; A. III, 8, 1; scales 40 in lateral line to base of caudal, and 2 more on latter; about 16 scales before dorsal; 6 scales obliquely back from origin of dorsal to lateral line; 6 scales obliquely up from origin of ventral to lateral line; 5 scales obliquely up from origin of anal to lateral line; pectoral  $1\frac{1}{2}$  in head; ventral  $1\frac{2}{5}$ ; snout 3 in head, from tip of upper jaw; eye  $3\frac{3}{4}$ ; interorbital space  $2\frac{1}{16}$ . Rakers absent. Color in alcohol with each scale marked medianly with a pale area so that longitudinal series are formed, becoming convergent posteriorly. Length  $5\frac{1}{2}$  inches (caudal damaged).

Also another, 3 inches long, with same data. The opercular blotch, on both of my examples, appears to be superior according to such traces of it as remain, rather than inferior as indicated on Kner's figure.

**Pithecocharax ucayalensis** sp. nov. Fig. 16.

Head 3; depth  $3\frac{1}{2}$ ; D. III, 10; A. III, 8, 1; P. I, 12; V. I, 8; scales about 33? in lateral line to base of caudal (squamation injured), and apparently several more on latter; about 5? scales between origin of dorsal, obliquely back, and lateral line; about 4? scales between lateral line and origin of anal; width of head about  $2\frac{1}{2}$  in its length; depth of head, over middle of orbit, about 2; least depth of caudal peduncle  $3\frac{1}{2}$ ; snout  $3\frac{1}{8}$  in head, measured from tip of upper jaw; eye 3; interorbital space 3.

Body elongate, compressed, back a little elevated or with upper profile a little more convex than lower, and greatest depth about middle of predorsal region. Predorsal, postdorsal, and preventral regions (desquamated) apparently rounded. Postventral region possibly with median keel? Caudal peduncle compressed, and least depth about  $\frac{3}{4}$  its length.

Head compressed, elongate, and attenuate inferiorly, or with upper profile much more inclined than lower. Snout short, moderately broad, straight in profile and upper surface convex. Eye circular and



a little anterior. Mouth superior and mandible well protruding in front, cleft nearly vertical. Maxillary small and vertical. Teeth large, sharp, crenulate, uniserial, and two median mandibulars largest and most conspicuous. Tongue rather broad, rounded, and hardly free. Anterior nostril in a fleshy tube about equal to diameter of pupil in length, lateral, and nearly midway in length of snout. Posterior nostril large, a little inclined, slit-like, and close to middle of anterior rim of orbit. Interorbital space broad and nearly flattened.

Gill-opening extending about opposite posterior margin of pupil.

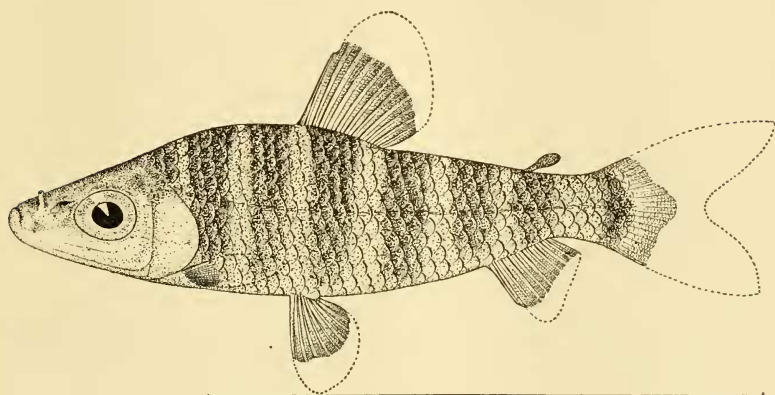


Fig. 16.—*Pithecocharax ucayalensis* Fowler.

Rakers short weak fleshy protuberances, and moderately numerous. Filaments well developed.

Scales mostly fallen, large, evidently in rows parallel with lateral line, and also apparently all of more or less even size. Base of caudal apparently scaly. Lateral line evidently complete, and of simple tubes.

Origin of dorsal nearly midway between tip of mandible and base of caudal. Origin of adipose fin placed about last fourth in space between origin of dorsal and base of caudal. Anal inserted well behind dorsal, or near middle of space between end of ventral and base of caudal. Pectoral low, and though damaged apparently not reaching ventral. Ventral inserted a short distance before origin of dorsal, and though also damaged not reaching perhaps more than half way to anal.

Color in alcohol brown, lower surface and fins paler. Body with

about seven broad ill-defined dark brown or dusky transverse bands. First three nuchal or predorsal, fourth from base of dorsal, fifth and sixth from postdorsal region, and seventh from base of adipose fin. Fins pale, caudal lighter and with a subbasal transverse blackish line. Iris brownish.

Length (caudal damaged)  $1\frac{1}{4}$  inches.

Type, No. 21,997, A. N. S. P. Peruvian Amazon or Ucayale River. Prof. J. Orton. Coll. Prof. E. D. Cope.

This species is distinguished from *Pithecocharax anostomus* (Linnæus) and *P. trimaculatus* (Kner) chiefly by the coloration.

(Named for the Ucayale or Ucayali River, sometimes called Peruvian Amazon or Paro.)

**Shoizodon fasciatus** Agassiz.

Cope, Proc. Amer. Philos. Soc. Phila., XI, 1869-70 (August 19, 1870), p. 566.

Para. De Schulte Buckow.—Cope, *l.c.*, XVII, 1877-78 (May 17, 1878), p. 689. Peruvian Amazon. Prof. J. Orton.

*Anostomus fasciatus* Cope, Proc. Acad. Nat. Sci. Phila., 1871 (1872), p. 258. Ambyiacu River, Equador. John Hauxwell.

Head  $3\frac{3}{8}$ ; depth  $3\frac{1}{8}$ ; D. II, 9, 1; A. II, 8, 1; scales 37 in lateral line to base of caudal, and 4 more on latter; 11 scales before dorsal; 5 scales obliquely back from dorsal to lateral line; 5 scales obliquely up from origin of ventral to lateral line; 4 scales obliquely up from origin of anal to lateral line; pectoral  $1\frac{3}{7}$  in head; ventral  $1\frac{2}{7}$ ; snout  $2\frac{9}{10}$  in head, from tip of upper jaw; eye  $3\frac{3}{4}$ ; interorbital space 2. Rakers none. Coloration faded dull brown. Length  $6\frac{1}{8}$  inches (caudal damaged). Para, Brazil. De Schulte Buckow. Prof. E. D. Cope.

Three examples from the Peruvian Amazon, the largest about  $7\frac{1}{2}$  inches in length, show: Head  $3\frac{3}{8}$  to 4; depth  $3\frac{1}{8}$  to  $3\frac{3}{8}$ ; D. II, 10, 1; A. III, 8, 1; scales 38 to 40 in lateral line to base of caudal, and 4 on latter. The color-pattern is constant. None of my examples show the dark transverse bar on the lower caudal lobe figured by Agassiz. The dark bars on the trunk are not absolutely vertical, the first two at least inclined a little back. They are also placed about equal in space and not extending across the ventral surface. Agassiz also indicates the eye too low in depth of head.

One example from the Ambyiacu,  $7\frac{1}{8}$  inches long (caudal damaged). John Hauxwell. It agrees with the Orton examples.

**Læmolyta tæniata** (Kner).

Cope, Proc. Acad. Nat. Sci. Phila., 1871 (1872), p. 259. Ambyiacu River, Equador. John Hauxwell.

Head 4; depth 5; D. II, 10, 1; A. III, 8, 1; scales 37 in lateral line to base of caudal, and 5 more on latter; 5 scales obliquely back from

origin of dorsal to lateral line; 4 scales obliquely up from origin of ventral to lateral line; 4 scales from origin of anal obliquely up to lateral line; 13 scales before dorsal; pectoral  $1\frac{2}{3}$  in head; ventral  $1\frac{1}{2}$ ; snout 3 in head, from tip of upper jaw; eye 3; interorbital space  $2\frac{1}{2}$ . Rakers none. Length  $4\frac{1}{2}$  inches (caudal damaged). Two examples.

The median dusky longitudinal band extends from the snout to the caudal. Kner's figure does not indicate it on the side of the snout or on the postocular region.

PECILOMATOPS subgen. nov.

Type *Characidium etheostoma* Cope.

Scales smaller transversely, about 4 from opposite origin of anal in an oblique series forward to lateral line.

(Ποικιλός, variegated; σῶμα, body; ὤψ, appearance. *Pencilosoma* was an old name employed by Agassiz for certain *Etheostomatinæ*, to which these fishes bear a certain resemblance.)

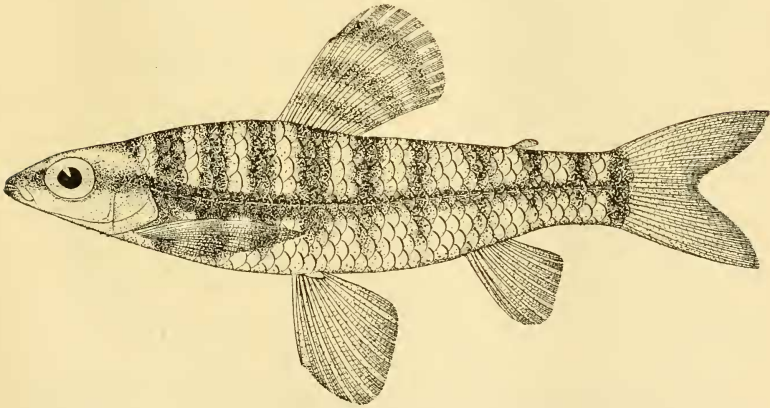


Fig. 17.—*Characidium etheostoma* Cope.

*Characidium etheostoma* Cope. Fig. 17.

Proc. Acad. Nat. Sci. Phila., 1871 (1872), p. 259, Pl. 13, fig. 3. No. 8,152 (type) and 8,153, A. N. S. P., cotypes. Ambyiaeu River, Equador. John Hauxwell.

Scales 11 before dorsal; width of head about  $2\frac{1}{2}$  in its length; interorbital space  $3\frac{1}{4}$ . Body well compressed. Muzzle compressed. Snout rather narrow. Lips thin. Teeth in jaws uniserial, even and fine, none on maxillaries. Interorbital space convex. Gill-opening

extending forward opposite posterior margin of pupil. Rakers short, lanceolate and weak, in small number. Filaments well developed. Isthmus a little broad. Each scale with several radiating striæ. Vent placed about last  $\frac{2}{3}$  in space between origins of ventrals and anal. Color in alcohol brownish, lower surface paler, and fins still paler. Body with about eleven transverse brownish bands, at first of about equal width with alternate interspaces, but posteriorly interspaces becoming wider. First band nuchal, second and third predorsal, fourth just before origin of dorsal, fifth from middle of base of dorsal, sixth from just behind last dorsal ray, seventh and eighth from post-dorsal region with latter entirely in front of adipose fin, ninth and tenth across caudal peduncle, and eleventh which is dusky on base of caudal. A rather narrow deep brownish band from tip of snout across side of head and embracing lateral line to base of caudal. Dorsal with at least three brownish longitudinal rather narrow bands or lines, upper ones less distinct. Iris brassy-silvery. Length  $1\frac{1}{2}$  inches. Type.

From Dr. Steindachner's description it would hardly seem probable that his *Characidium purpuratum* is identical with *C. theostoma*, in fact it falls in a different subgenus as the species are here understood if there are but  $2\frac{1}{2}$  to 3 scales between the origin of the anal and the lateral line.

Subgenus CHARACIDIUM Reinhardt.

Scales large transversely, about 3 from opposite origin of anal in an oblique series forward to lateral line.

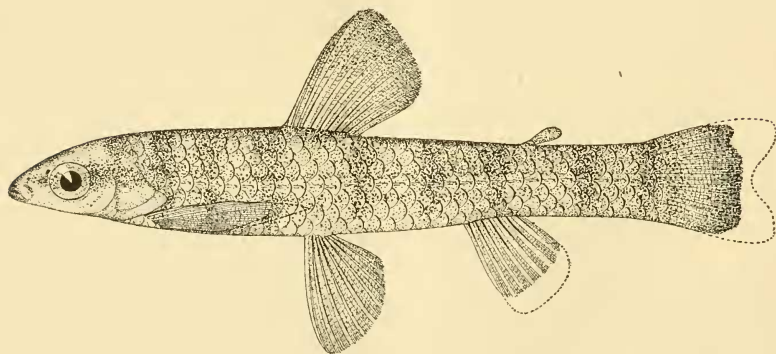


Fig. 18.—*Characidium steindachneri* Cope.

**Characidium steindachneri** Cope. Fig. 18.

Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878). p. 688. No. 21,428, A. N. S. P., type. Peruvian Amazon. Prof. J. Orton. Coll. of 1873.

Width of head  $2\frac{1}{2}$  in its length. Gill-opening extending forward about opposite middle of pupil. Vent about last fourth in space between origins of ventral and anal. Color in alcohol brownish with about 9 transverse distinct dusky bars. Fins all pale brownish. Iris brownish. Length about  $1\frac{1}{16}$  inches (caudal damaged). Otherwise like the preceding.

**Characidium tenuis** (Cope).

*Chorimycteris tenuis* Cope, Amer. Nat., XXVII, 1894, p. 67. The upper waters of the Jacuhy River, in the Brazilian State of Rio Grande do Sul. H. H. Smith.—Cope, Proc. Amer. Philos. Soc. Phila., XXXIII, 1894 (January 5), p. 86, Pl. 5, fig. 3.

Head  $4\frac{2}{5}$ ; depth  $6\frac{2}{5}$ ; D. III, 9; A. III, 6. 1; scales 36 in lateral line to base of caudal and 2 more on latter; 4 scales obliquely back between origin of dorsal and lateral line; 3 scales obliquely back from origin of adipose fin to lateral line; 3 scales from opposite origin of ventral obliquely up and forward to lateral line; 3 scales obliquely forward and up from origin of anal to lateral line; 12 scales before dorsal; width of head 2 in its length; snout about  $4\frac{1}{2}$ ; eye  $3\frac{3}{8}$ ; maxillary  $4\frac{1}{2}$ ; interorbital space about 5; least depth of caudal peduncle  $2\frac{1}{2}$ ; length of depressed dorsal about 4; lower caudal lobe (damaged) about 4; pectoral  $4\frac{1}{2}$ ; ventral 5; depressed anal  $5\frac{1}{2}$ . Edges of trunk rounded. Gill-opening extending about opposite posterior margin of orbit. Rakers about 5 + 7, short, lanceolate and rather well separated. Filaments a little less than vertical diameter of orbit. Isthmus a little broad and triangular. Vent about first  $\frac{2}{3}$  in space between origins of ventrals and anals. Color in alcohol brownish, rather pale, especially below, and side with silvery reflections. Each scale of back with darker brown edge than shade of body-color. About 8 indistinct brownish transverse bars. Fins pale brownish, shaded with darker, anal and ventral a little lighter. Iris pale brownish. Length  $2\frac{9}{16}$  inches (caudal damaged). Type. The other example agrees.

This species is most closely related to *C. steindachneri* Cope, but differs chiefly in the slightly larger eye and more slender body.

The main character advanced for the nominal genus *Chorimycteris*, i.e., the presence of biserial mandibular teeth, is entirely fallacious, as both of the cotypes before me have but a single series in the mandible. It is therefore a synonym of *Characidium*.

## Subgenus RHYTIODUS Kner.

Scales small, 80 to 90 or more in a lateral series.

**Rhytiodus microlepis** Kner.

Head  $4\frac{2}{3}$ ; depth  $5\frac{2}{3}$ ; D. II, 10, 1; A. II, 8, 1; scales 77 in a lateral series to base of caudal, and 8 more on latter; 12 scales obliquely back from origin of dorsal to lateral line; 9 scales obliquely up posteriorly from origin of ventral to lateral line; 8 scales from origin of ventral in a similar way; about 23? (squamation damaged) scales before dorsal; snout  $2\frac{3}{4}$  in head; eye 5; interorbital space 2; pectoral  $1\frac{1}{2}$ ; ventral  $1\frac{1}{4}$ ; least depth of caudal peduncle  $2\frac{2}{3}$ . Small short slender weak gill-rakers developed on outer edge of first arch. Pebas, Equador. Prof. J. Orton. Coll. 1873-77. Prof. E. D. Cope.

## GARMANINA subgen. nov.

Type *Rhytiodus argenteo-fuscus* Kner.

Restricted to those species of *Rhytiodus* Kner with large scales, about 50 to 60 in a lateral series.

(Named for Prof. Samuel Garman, of Cambridge, Mass., author of many excellent contributions to Ichthyology.)

**Rhytiodus argenteo-fuscus** Kner.

*Schizodon sagittarius* Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 689. No. 21,474, A. N. S. P., type. Peruvian Amazon. Prof. J. Orton. Coll. of 1877.

Head  $4\frac{2}{3}$ ; depth  $5\frac{1}{2}$ ; D. III, 10; A. III, 8; scales 47 in lateral line to base of caudal, and 5 more on latter; 7 scales obliquely back from origin of dorsal to lateral line; 4 scales obliquely back from origin of adipose fin to lateral line; 6 scales obliquely up from origin of anal to lateral line; about 16 scales before dorsal; width of head  $1\frac{1}{2}$  in its length; depth of head over middle of orbit  $2\frac{2}{3}$ ; least depth of caudal peduncle 3; pectoral  $1\frac{1}{2}$ ; ventral  $1\frac{1}{4}$ ; depressed dorsal  $4\frac{1}{4}$ ; fourth anal ray  $1\frac{5}{8}$ ; snout  $2\frac{3}{4}$  in head measured from tip of upper jaw; eye about  $4\frac{1}{2}$ ; interorbital space  $2\frac{1}{3}$ . Body tapering evenly back from opposite origins of dorsal and ventral. Predorsal region with an obtuse median keel. Postdorsal region flattened. Preventral region rounded, except region right at bases and just before ventrals, which is flattened. Postventral region apparently rather rounded. Least depth of caudal peduncle about half its length. Head depressed above and below anteriorly, and with convex surface. Snout broad, rounded when viewed above. Width of mouth about  $\frac{3}{4}$  of orbit. Teeth broadly expanded or compressed. Maxillary reaching about to posterior nostril. Anterior nostril in a short tube. Interorbital space broadly convex. Gill-opening extending forward about opposite last fourth in



head. Rakers short, not numerous and weak. Filaments equal orbit. Isthmus broad and convex. Scales non-striate. Ventral scaly flap  $\frac{2}{3}$  of fin. Pectoral reaching  $\frac{2}{3}$  of space to ventral, and ventral  $\frac{2}{3}$  to anal. Vent close in front of anal. Color in alcohol brownish, upper  $\frac{2}{3}$  of body darker and sharply demarcated from lower or whitish surface, and former color extending well below lateral line. Dorsal and caudal brownish, especially middle of each lobe of latter. Pectoral, ventral and anal pale brownish, especially latter. Line of demarcation on sides pronounced by a longitudinal lateral band extending from tip of snout to base of caudal. Iris brownish. Length  $6\frac{3}{8}$  inches.

Prof. Garman's view that this is the young of *R. argenteo-fuscus* Kner is fully established, as I find that the mandible has 8 teeth rather than 6 as stated by Cope.

**Leporellus vittatus** (Valenciennes).

*Leporinus vittatus* Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 690. Peruvian Amazon. Prof. J. Orton. Coll. of 1877.

Head  $3\frac{3}{8}$ ; depth  $3\frac{1}{8}$ ; D. III, 10, 1; A. III, 8; P. II, 16; V. II, 8; scales 37? (squamation injured) in lateral line to base of caudal, and 5? more on latter; 5 scales obliquely back from origin of dorsal to lateral line; 4 scales obliquely up posteriorly from origin of ventral to lateral line; 14? scales (squamation injured) before dorsal; snout  $2\frac{1}{2}$  in head; eye 4; interorbital space  $2\frac{1}{2}$ ; least depth of caudal peduncle 3. Gill-rakers short weak fleshy processes. Color in alcohol with back sharply defined from that of band running along lateral line, which is also well defined and dark. A narrow line on flank, well below lateral line, extending from base of pectoral to origin of anal. Top of head with indistinct brownish spots. Dorsal blackish with a broad transverse whitish band below middle. Length  $2\frac{1}{4}$  inches.

Castelnau figures *Leporinus vittatus* Valenciennes, which will be seen to differ at once in the coloration. It shows each scale of the back marked with a single black spot and the dorsal crossed by a blackish transverse band a little above its middle. The side of the head is spotted, and there are also no traces on the trunk of the dark contrasted color-pattern which my example now shows. Kner's figure of *Leporinus pictus* agrees better, and though it differs according to the figure in having a pale dorsal marked above and in front with a dark blotch, another or basal one is mentioned in the description. The figure also shows no trace of the lower dusky line seen on my example, which extends from the pectoral to the anal. Dr. Steindachner records a large example from Cauca which had both dorsal and anal fins marked with blackish bands.

**Leporinus fasciatus** (Bloch).

Head  $3\frac{1}{3}$ ; depth  $2\frac{2}{3}$ ; D. III, 10, 1; A. III, 8, 1; scales 34 in lateral line to base of caudal, and 5 more on latter; 6 scales obliquely back from origin of dorsal to lateral line; 5 scales obliquely up from origin of ventral to lateral line; 5 scales obliquely forward from origin of anal to lateral line; 12 scales before dorsal; snout  $2\frac{1}{2}$  in head; eye  $4\frac{1}{8}$ ; interorbital space  $2\frac{2}{3}$ ; pectoral  $1\frac{1}{7}$ ; ventral  $1\frac{2}{5}$ ; least depth of caudal peduncle  $2\frac{1}{3}$ . Middle of orbit a little anterior in head. Rakers 5 + 8, denticle-like, compressed and weak. Predorsal and postdorsal regions rounded. Very slight lateral keel on each side of postventral region, and also one on each side of preventral region. Median line of both these areas also with a slight keel, that of latter most pronounced. In coloration it agrees largely with Bloch's figure. The occipital band is broader. First band on trunk forking above, second inclined to base of pectoral, sixth also forked above and extending towards origin of anal, seventh from base of adipose fin to bases of last anal rays, and last or ninth in form of large blotch at base of caudal. An indistinct brownish bar about opposite middle of pectoral and a blotch near its tip or above base of ventral. Traces of two transverse caudal bands. Length  $5\frac{1}{2}$  inches (caudal damaged). Rio Parahyba, Brazil. Museum of Comparative Zoology, Massachusetts. One example.

**Leporinus friderici** (Bloch).

*Leporinus frederici* Cope. Proc. Amer. Philos. Soc. Phila., XI, 1869-70 (August 19, 1870), p. 566. Pebas, Eastern Peru. John Hauxwell.—Cope, *l.c.*, XVII, 1877-78 (May 17, 1878), p. 690. Peruvian Amazon. Prof. J. Orton.

Head  $3\frac{1}{3}$  to  $3\frac{1}{4}$ ; depth  $3\frac{1}{8}$  to  $3\frac{2}{5}$ ; D. II or III, 10, 1; A. III, 8, 1; scales 33 to 35 in lateral line to base of caudal, and usually 4 more on latter; 11 to 13 scales before dorsal; 5 scales in an oblique series back from origin of dorsal to lateral line; 5 scales obliquely forward from origin of ventral to lateral line; 5 scales obliquely forward from origin of anal to lateral line; snout  $2\frac{3}{8}$  to 3 in head; eye  $3\frac{3}{8}$  to  $4\frac{5}{8}$ ; interorbital space 2 to  $2\frac{1}{4}$ . Gill-rakers slender short denticles usually a little bent distally, and about 20? on first arch. Color in alcohol very dark, base of each scale darker than other portion, and line of demarcation very distinct, so that an imbricated appearance is assumed. In smaller examples pectoral approaches nearer ventral than in adults. Total length of 7 examples  $3\frac{1}{2}$  to 9 inches. Peruvian Amazon. Prof. J. Orton. Coll. of 1877.

Two examples from Pebas. John Hauxwell. Both show about same number of scales as preceding. The smaller one has the dark lateral blotches more or less confluent posteriorly, as described by Dr. Günther.

The above specific name is restored in the original, for in all cases Bloch spelled it exactly as above.

**Leporinus multifasciatus** Cope. Fig. 19.

Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 690.

Peruvian Amazon. Prof. J. Orton.

*Leporinus megalepis* Cope, *l.c.*, XI, 1869-70 (May 19, 1870), p. 566. Para. De Schulte Buckow.—Cope, Proc. Acad. Nat. Sci. Phila., 1871 (1872), p. 259. Ambyiacu River, Equador. John Hauxwell.

The cotypes of *L. multifasciatus*, Nos. 21,448 (type) to 21,450, A. N. S. P., are in very poor condition, though they appear to be identical with the other material. The largest shows: Head  $3\frac{1}{2}$ ; depth  $3\frac{3}{8}$ ; D. II, 10; A. IV, 8; width of head 2 in its length; depth of head over middle of orbit 2; snout 3 in head from tip of upper jaw; eye  $3\frac{1}{2}$ ; interorbital space  $2\frac{1}{2}$ ; least depth of caudal peduncle  $2\frac{1}{2}$ . Though dark lateral blotches are not present they may have faded. Length of type  $2\frac{1}{2}$  inches.



Fig. 19.—*Leporinus multifasciatus* Cope.

The example from Para has very indistinct bands on the back and a rather long pectoral.

The largest of the Hauxwell examples shows: Head  $3\frac{1}{3}$ ; depth 3; D. III, 10, 1; A. III, 8, 1; scales 33 in lateral line to base of caudal, and 4 more on latter; 5 scales obliquely back from origin of dorsal to lateral line; 4 scales obliquely up from origin of anal to lateral line; 10 scales before dorsal; width of head  $1\frac{1}{4}$  in its length; third dorsal ray  $1\frac{1}{4}$ ; third anal ray  $1\frac{2}{3}$ ; pectoral  $1\frac{2}{3}$ ; ventral  $1\frac{1}{2}$ ; least depth of caudal peduncle  $2\frac{2}{3}$ .

snout  $2\frac{5}{8}$  in head from tip of upper jaw; eye  $3\frac{5}{8}$ ; maxillary  $4\frac{1}{2}$ ; interorbital space  $2\frac{1}{3}$ ; upper caudal lobe nearly 3 in head and trunk. Predorsal region rounded at first and posteriorly with a median keel extending to dorsal fin. Postdorsal region rounded, also preventral region. Postventral region with a median obscure keel. Head broad, depressed in front, rounded below and sides somewhat compressed. Snout when viewed above broad and triangular with rounded tip. Width of mouth about  $\frac{3}{4}$  of orbit. Maxillary about half way in snout. Lips fleshy. Teeth 8 in each jaw, anterior largest, and 2 median mandibulars especially conspicuous. Tongue rather far back, narrow, and not free. Interorbital space broadly convex. Gill-opening extending forward about first third in head. Rakers  $10 + 14?$ , short, lanceolate, and longest about half of longest filaments which are  $\frac{2}{3}$  of orbit. Vent close in front of anal. Color in alcohol faded brownish, a little darker on back and upper surface. About 14 indistinct bars of deeper brownish than body-color across back, and each one also narrower than pale interspace. In some cases they become faded altogether on side, and frequently indistinct traces occur below. Three blotches of deep brownish, larger than eye, along middle of side. First blotch midway in length of trunk, and second midway between it and third, which is on base of caudal. Dorsal, caudal and pectoral pale, and anal and ventral dusky or deep brown. Iris brown. Teeth warm brownish marginally. Length  $4\frac{5}{8}$  inches. Identified with *L. megalepis* Günther, but that species is said to have the body with large blackish spots arranged in 2 or 3 series.

**Leporinus holostictus** Cope. Fig. 20.

Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 690. Nos. 21,467 (type) and 21,468, A. N. S. P., cotypes. Peruvian Amazon. Prof. J. Orton. Coll. of 1877.

Width of head  $2\frac{1}{10}$  in its length; interorbital space  $2\frac{1}{2}$ . Predorsal, postdorsal and preventral regions rounded. Postventral region with an obsolete median keel, and another on each side. Snout broad and triangular seen from above. Lips fleshy. Teeth 8 in each jaw, anterior ones largest, and 2 median mandibulars conspicuous. Tongue rather far back, narrow and not free. Interorbital space broadly convex. Gill-opening extending forward about last fourth in length of head. Rakers  $5 + 11?$ , short, lanceolate, and longest about  $\frac{2}{3}$  of longest filaments, which are  $\frac{2}{3}$  of orbit. Scales non-striate. Color in alcohol brownish, and lower surface paler or whitish. Body with 10 broad transverse bands as wide as interspaces. First includes or extends over snout, second over interorbital space, third on occiput,

fourth on middle of predorsal region, fifth just before dorsal, sixth vertically across dorsal so that its posterior margin is even with last ray and then down till behind ventral, seventh on postdorsal region anteriorly, eighth on postdorsal region posteriorly till down just in front of anal, ninth behind adipose fin and continued transversely

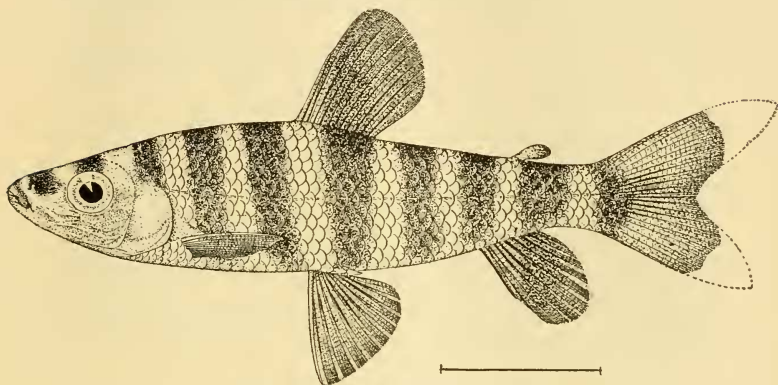


Fig. 20.—*Leporinus holostictus* Cope.

across anal, and tenth at base of caudal. Fins otherwise all more or less unmarked, except posterior margin of caudal which is dusky. Iris brownish. Length  $4\frac{3}{4}$  inches (caudal damaged). Type. The other example shows the depth as  $3\frac{1}{2}$ .

**ABRAMITES** gen. nov.

Type *Leporinus hypselonotus* Günther.

Closely related to *Leporinus* Agassiz, but distinguished by the larger anal basis.

(*Abramites*, from *Abramis*, *Bresma* and *Prasmus*, old names applied to *Brama brama* or the common European bream. The reference is to the superficial appearance.)

**Abramites hypselonotus** (Günther).

*Leporinus hypselonotus* Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17 1878), p. 690. Peruvian Amazon. Prof. J. Orton. Coll. of 1877.

Head  $3\frac{3}{4}$ ; depth  $2\frac{2}{5}$ ; D. III, 10; A. III, 12, 1; scales 34 in lateral line to base of caudal, and 4 more on latter; snout  $3\frac{1}{2}$  in head from tip of upper jaw; eye 3; interorbital space  $2\frac{2}{3}$ . Length  $2\frac{1}{8}$  inches.

Dr. Günther's excellent figure largely agrees, though my example

shows traces of an interorbital band and a nuchal one extending down just behind opercle.

## TETRAGONOPTERINÆ.

**Cheirodon monodon** (Cope).

*Cheirodon monodon* Cope, Proc. Amer. Philos. Soc. Phila., XXXIII, 1894 (January 5), p. 91, Pl. 6, fig. 9. Nos. 21,561 (type) and 21,562, A. N. S. P., cotypes. Brazilian province of Rio Grande do Sul. H. H. Smith.

Edge of back rounded, except a little before spinous dorsal and upper surface of caudal peduncle where it is a little trenchant. Belly rounded. Postventral region and lower surface of caudal peduncle a little trenchant. Each ramus of mandible elevated a little inside mouth. Tongue rather large, flattened, moderately broad and free in front. Interorbital space convex. Gill-opening extending forward nearly opposite anterior margin of orbit. Rakers 12 + 12 on first arch, lanceolate, and longest a little shorter than filaments, which are a little longer than pupil. Isthmus narrowly triangular. Vent close in front of anal. Color in alcohol pale brownish, back a little darker than lower surface, and body everywhere more or less silvered. A pale or dull leaden-brassy streak from above eye back to caudal. Fins all pale or immaculate brownish. Iris dull silvery. Length  $1\frac{1}{3}$  inches. Type.

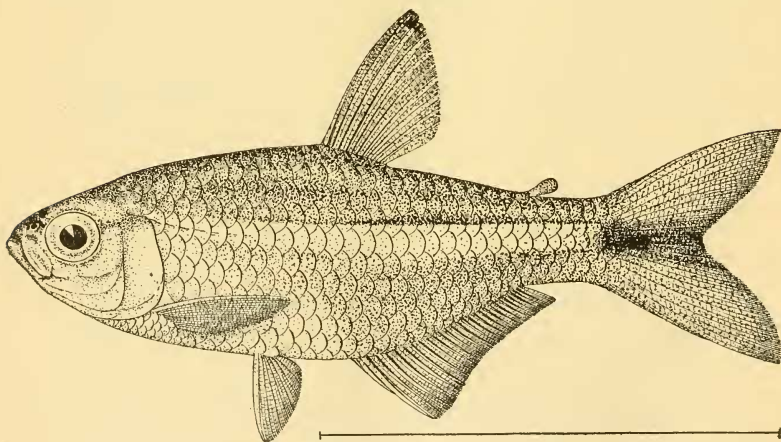


Fig. 21.—*Cheirodon pulcher* (Steindachner).

**Cheirodon pulcher** (Steindachner). Fig. 21.

*Tetraodon pulcher* Steindachner, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 691. Peruvian Amazon. Prof. J. Orton. (Part.)



Edges of body but little trenchant, or only upper and lower surfaces of caudal peduncle and postventral region. Rami of mandible well elevated inside mouth. Rakers 10 + 14 on first arch, lanceolate, and longest about length of filaments which are  $\frac{2}{3}$  of orbit. Scales non-striate. Color in alcohol brownish, back darker and lower surface paler, washed everywhere with more or less silvery. A dull leaden streak, a little high, from below dorsal to caudal and then continued out on its middle rays as dusky. Fins otherwise all dull brownish. Iris dull brassy. Length  $1\frac{3}{4}$  inches.

Two examples, wrongly identified by Cope with *Astyanax diaphanus*.

**Aphyocharax pusillus** Günther. Fig. 22.

Cope, Proc. Acad. Nat. Sci. Phila., 1871 (1872), p. 260. Ambyiacu River, Eastern Equador. John Hauxwell.—Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 689. Peruvian Amazon. Prof. J. Orton.

Interorbital space  $2\frac{1}{2}$  in head. Snout convex. Rami of mandible but little elevated inside of mouth. Tongue a little elongate, fleshy and free in front. Interorbital space broad and a little convex. Gill-openings extending forward till nearly opposite front margin of pupil.

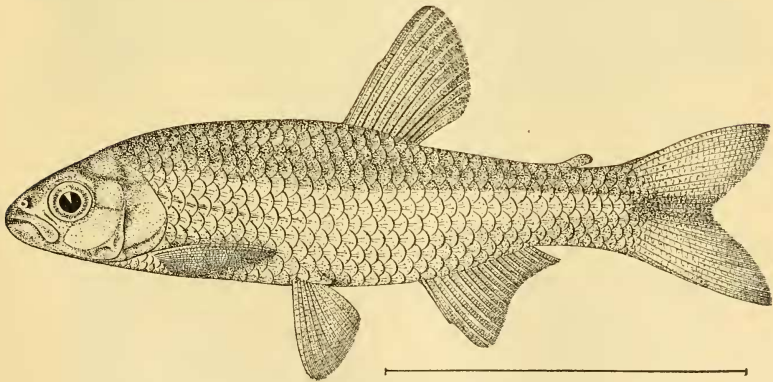


Fig. 22.—*Aphyocharax pusillus* Günther.

Rakers 7 + 8, short, pointed, and much less than filaments. Isthmus narrow and with median groove. Each scale with 2 or 3 striae. Color in alcohol brown, sides paler, and body more or less brassy. Fins brownish, median caudal rays dusky. Iris brownish. Length  $2\frac{5}{16}$  inches. Peruvian Amazon. Orton. Coll. of 1873.

Three examples from the Ambyiacu in the Hauxwell Coll. Head  $3\frac{5}{8}$  to  $3\frac{7}{8}$ ; depth  $3\frac{1}{2}$  to 4; D. II, 9; A. III or IV, 16, 1 to 18, 1; scales 32 to 34 in lateral line (squamation mostly injured) to base of caudal, and 2 more on latter; total length 2 to  $2\frac{1}{8}$  inches.

**Aphyocharax filigerus** Cope. Fig. 23.

Proc. Amer. Philos. Soc. Phila., XI, 1869-70 (August 19, 1870), p. 564.  
Nos. 8,059 (type) and 8,073, A. N. S. P., cotypes. Pebas, Eastern Equador.  
John Hauxwell.

Interorbital space 3 in head. Edges of trunk apparently more or less rounded. Rami of mandible hardly elevated inside mouth. Tongue a little long, narrow and free in front. Interorbital space elevated convexly. Gill-openings carried forward about first  $\frac{2}{3}$  of

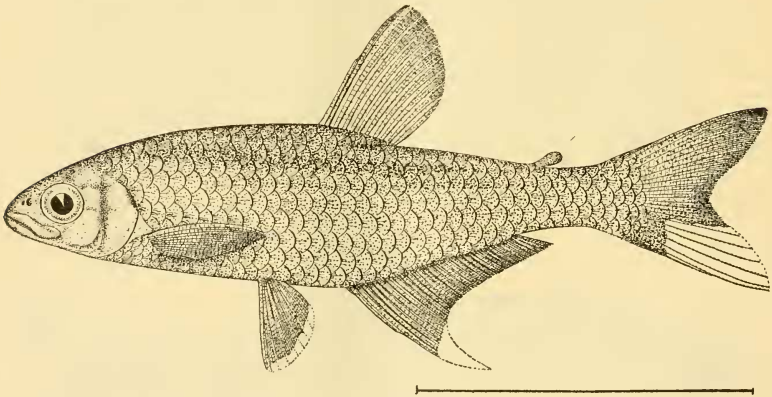


Fig. 23.—*Aphyocharax filigerus* Cope.

orbit. Rakers 7 + 10, lanceolate, and apparently longer than longest filaments or a little longer than half of orbit. Isthmus narrow. Color in alcohol faded dull brownish, and fins pale, though median caudal rays a little paler than rest of fin. Iris brownish. Length  $2\frac{1}{4}$  inches (caudal damaged). Type. Taken from the stomach of a siluroid.

**Diapoma speculariferum** Cope.

Amer. Nat., XXVIII, 1894, p. 67. No. 21,580, A. N. S. P., type. Upper waters of the Jacuhy River in Brazilian State of Rio Grande do Sul. H. H. Smith.—Cope, Proc. Amer. Philos. Soc. Phila., XXXIII, 1894 (January 5), p. 92, Pl. 5, fig. 4, from type.

Edge of back rounded. Upper and lower edges of caudal peduncle trenchant. Chest with a median rounded ridge. Postventral region

trenchant. Snout convex. Tongue small, a little back, narrow, and a little free. Interorbital space narrowly convex. Gill-opening carried forward nearly opposite anterior margin of orbit. Rakers 6 + 12?, slender, fine, longest a little longer than filaments and also present on lower portion of external arch. Isthmus rather broadly triangular. Scales striate. Vent close in front of anal. Color in alcohol more or less brownish, back more brown than lower surface and body with silvery wash. A leaden lateral streak from head opposite eye straight to base of caudal. Fins plain pale brownish. Eye brassy. Length  $1\frac{9}{16}$  inches.

Cope was entirely mistaken when stating that the inferior limb of the external branchial arches was without rakers.

**Hemigrammus schmardæ** (Steindachner).

Head 3; depth  $2\frac{3}{4}$ ; D. III, 9; A. IV, 21?; about 30? scales in a lateral count from gill-opening to caudal, including those on latter; snout  $4\frac{1}{2}$  in head, measured from tip of upper jaw; eye  $2\frac{1}{4}$ ; maxillary  $2\frac{2}{3}$ ; interorbital space 3. Color in alcohol brownish, scales fallen leaving a narrow silvery lateral band extending from shoulder to base of caudal. No blackish blotch at base of caudal, which while a little darker than rest of fin is not darker than peduncle. These conditions may all be due to the preservative. Length  $1\frac{3}{4}$  inches. A single small example in poor condition from the Peruvian Amazon. Coll. Prof. J. Orton.

**Hemigrammus interruptus** (Lütken).

*Hemigrammus luetkenii* Cope, Proc. Amer. Philos. Soc. Phila., XXXIII, 1894 (January 5), p. 91. In the Jacuhy (Brazilian province of Rio Grande do Sul). H. H. Smith.

The large series from the Jacuhy, Brazilian province of Rio Grande do Sul, and collected by H. H. Smith, shows: Head 3 to  $3\frac{3}{8}$ ; depth  $2\frac{1}{2}$  to  $2\frac{3}{4}$ ; D. III, 9; A. IV or V, 18, 1 to 22, 1, usually with 21, occasionally 22, sometimes 18, and rarely 20; scales 30 to 33 in lateral line to base of caudal, 2 or 3 more on latter, former count usually 33, frequently 32 or 31, and rarely 30; 11 or 12 scales in a transverse series obliquely back from origin of dorsal; 12 or 13 scales before dorsal; eye  $2\frac{1}{2}$  to 3 in head, measured from tip of upper jaw; length of specimens  $1\frac{5}{8}$  to 3 inches. Gill-rakers about 8 + 14.

**Hemigrammus robustulus** Cope. Fig. 24.

Proc. Amer. Philos. Soc. Phila., XI, 1869-70 (August 17, 1870), p. 561. Nos. 8,037 (type) to 8,052, A. N. S. P., cotypes. Pebas, Equador. John Hauxwell.—Cope, *l.c.*, XVII, 1877-78 (May 17, 1878), p. 690. Peruvian Amazon. Prof. J. Orton.

Body strongly compressed. Rami of mandible but little elevated inside mouth. Tongue rather flat, rounded, compressed and a little

free. Interorbital space rather broad and a little convex. Gill-opening extending forward to anterior margin of pupil. Rakers about a dozen? on lower outer limb of first arch. Filaments short. Isthmus narrow. Scales striate. Color in alcohol pale or dull brown, abdominal region and lower surface of head paler. Flanks also tinted with a livid grayish or dull slaty hue. A streak of slaty, diffuse and indistinct at first, extending along side of caudal peduncle and then continued out on median caudal rays as a blackish band. A dusky diffuse humeral blotch about size of orbit. Fins otherwise mostly uniform dull brownish. Muzzle deep brownish and front of mandible same.

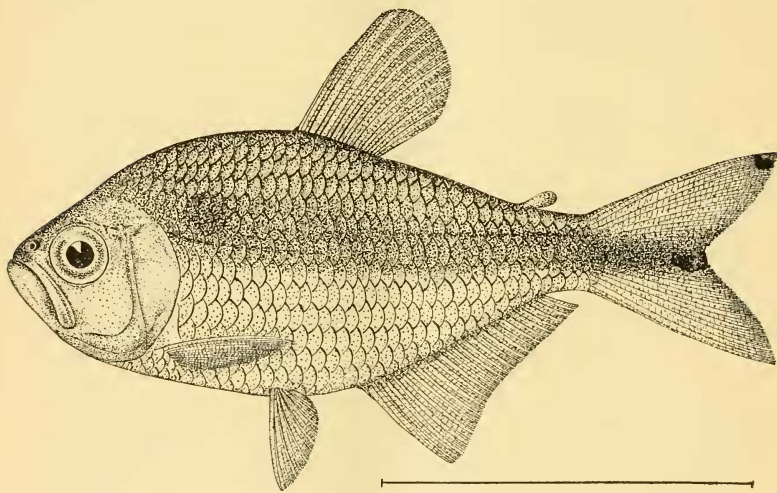


Fig. 24.—*Hemigrammus robustulus* Cope.

Spots or specks on cheek indistinct. Iris dusky-coppery. Length 2 inches (caudal damaged). Type.

The other cotypes range as follows: Head  $2\frac{2}{3}$  to  $3\frac{1}{2}$ ; depth 2 to  $2\frac{2}{3}$ ; D. II, 9; A. III, 23 to III, 29, 1; scales 27 to 32 (squamation mostly injured); total length  $1\frac{1}{2}$  to 2 inches.

Other examples in the Hauxwell Coll.

***Astyanax lepidurus* (Kner).**

*Tetragonopterus lepidurus* Cope, Proc. Amer. Philos. Soc. Phila., XI, 1869-70 (August 19, 1870), p. 566. Para. Mr. De Schulte Buckow.

Head  $3\frac{1}{2}$ ; depth  $3\frac{2}{3}$ ?; D. III, 9; A. III, 21?; scales (according to pockets)

about 33? in a lateral series to base of caudal; 9? scales between dorsal and ventral; snout 4 in head, measured from tip of upper jaw; eye  $2\frac{2}{5}$ ; maxillary  $2\frac{1}{2}$ ; interorbital space  $3\frac{1}{3}$ ; least depth of caudal peduncle 3. Maxillary toothless and extending posteriorly a little beyond front rim of orbit, not to pupil. Rakers 10 + 16?, long, slender, and longest nearly as long as longest filaments. Scales large, mostly all fallen, and in alcohol leaving a narrow silvery band broadening out on posterior  $\frac{2}{3}$  of its course till about equal to diameter of pupil. No evidence of humeral or caudal blotches. Median caudal rays dusky, also tips of upper and lower lobes. Length  $1\frac{3}{8}$  inches. This example was received from Cope, and is most likely the one referred to above.

**Astyanax ipanquianus** (Cope). Fig. 25.

*Tetragonopterus ipanquianus* Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 4, 1878), p. 44. Nos. 21,114 (type) and 21,115, A. N. S. P., cotypes. The upper waters of the Urubamba, one of the sources of the Ucayale. Prof. J. Orton. Coll. of 1876-77.—Cope, *l.c.*, p. 692. Urubamba River; elevation 11,500 feet. Prof. J. Orton.

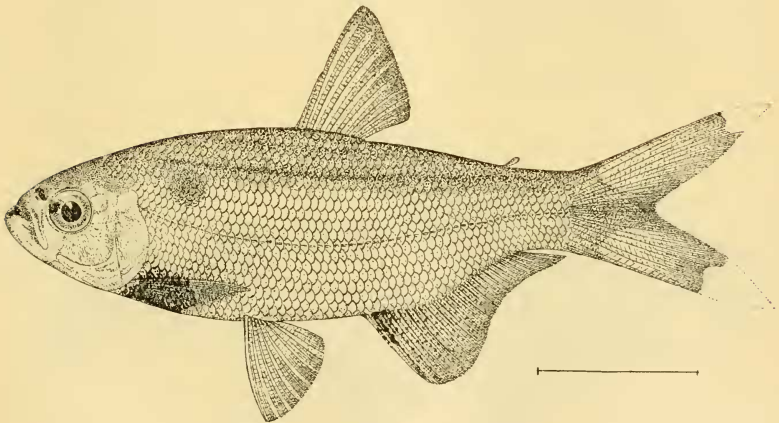


Fig. 25.—*Astyanax ipanquianus* (Cope).

Body compressed, and edges rounded. Snout convex. Rami of mandible not elevated inside mouth. Lips thin. Tongue fleshy, broad, rounded in front and hardly free from floor of mouth. Interorbital space convex. Gill-opening extending forward about opposite anterior nostril. Rakers 9 + 11, lanceolate, short, and longest a little less than half length of longest filaments. Filaments  $\frac{3}{4}$  an eye-

diameter. Isthmus long and narrowly triangular. Each scale with a number of striae. Color in alcohol dull brassy-brown with silvery reflections, back slightly more brownish with a leaden tint. A humeral blotch of grayish about equal to orbit in size. Top of head brownish. Fins pale brownish, dorsal and caudal a trifle darker than others. Iris dull brassy-brown. Length (caudal slightly damaged) 5 inches. Type.

The other examples, including those later reported by Cope, show: Head  $3\frac{1}{2}$  to 4; depth 3 to  $3\frac{3}{4}$ ; D. II, 8; A. III or IV, 23, 1 to 27, 1; scales about 50? (squamation damaged) to 55 in lateral line to base of caudal, and 2 or 3 on latter; 23 to 25 scales before dorsal; 11 scales in an oblique series back from origin of dorsal to lateral line; 8 or 9 scales in a vertical series between lateral line and origin of anal; eye  $3\frac{1}{4}$  to 4 in head; total length  $2\frac{1}{4}$  to  $4\frac{3}{8}$  inches.

**Astyanax phœniopterus** (Cope). Fig. 26.

*Tetragonopterus phœniopterus* Cope, Proc. Acad. Nat. Sci. Phila., 1871 (1872), p. 261. Nos. 8,093 (type) to 8,128, A. N. S. P., cotypes. Ambiyacu River, Ecuador. John Hauxwell.

Gill-opening extending forward about opposite anterior margin of

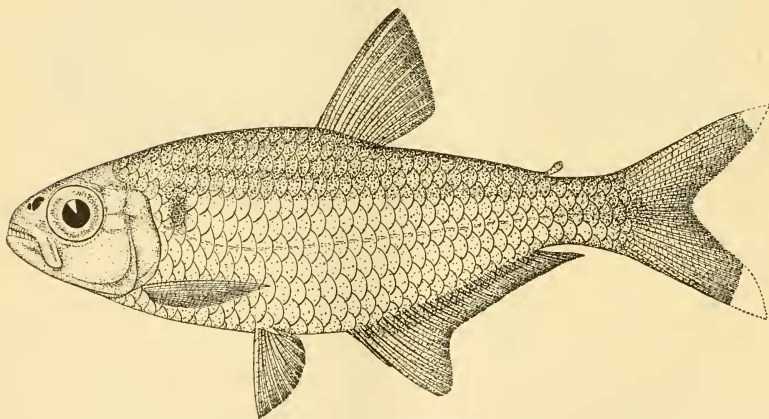


Fig. 26.—*Astyanax phœniopterus* (Cope).

pupil. Rakers small and inconspicuous, about 7? on lower part of first arch. Filaments short. Isthmus compressed and narrow. Color in alcohol dull brown, more or less silvery. Side of head silvery.



Lower surface of body pale brown, and peritoneum showing through pale. A dusky humeral and caudal spot. Fins and iris pale brownish. Length (caudal damaged)  $2\frac{1}{4}$  inches. Type.

The other cotypes vary as follows: Head  $2\frac{1}{2}$  to 4, usually a little less than 4; depth 3 to  $3\frac{1}{4}$ ; D. III, 8, rarely III, 7; A. IV, 21 to 26, and frequently I, branched rays frequently 25; scales 30 to 35 (squamation damaged); total length  $1\frac{1}{2}$  to  $2\frac{1}{4}$  inches.

**Astyanax diaphanus** (Cope). Fig. 27.

*Tetragonopterus diaphanus* Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 691. Nos. 21,216 (type) to 21,218, A. N. S. P., cotypes. Peruvian Amazon. Prof. J. Orton. Coll. of 1874.

Predorsal region with an obsolete median keel, and postdorsal region rounded. Preventral region rounded and postventral region trenchant. Rakers 7 + 10, slender, lanceolate, and longest a trifle more than longest filaments which are about equal to diameter of pupil. Isthmus narrowly triangular. Color in alcohol dull brownish, more or less brassy, and especially broad band from eye to base of caudal. Fins all dull brownish. Iris brownish-yellow. Length  $2\frac{1}{16}$  inches. Type.

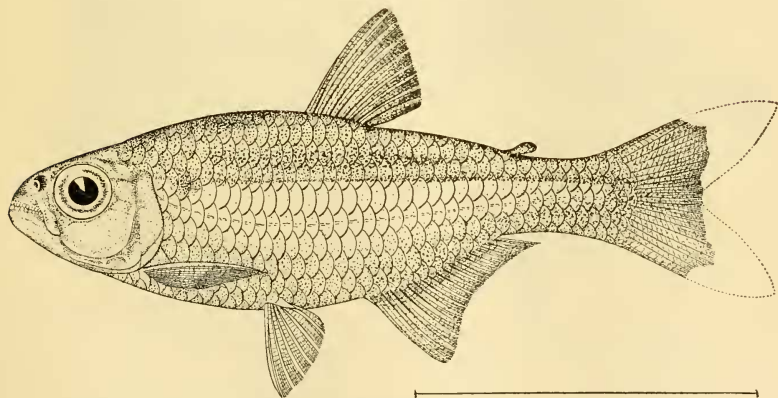


Fig. 27.—*Astyanax diaphanus* (Cope).

The other examples show: Head  $3\frac{5}{8}$  to 4; depth  $3\frac{1}{2}$  to  $3\frac{1}{4}$ ; D. II, 8; A. III, 17, I to 22, I; scales 33 in lateral line to base of caudal and 3 more on latter; usually 4 scales in a vertical series between origin of anal and lateral line; eye  $2\frac{1}{2}$  to  $2\frac{3}{8}$  in head; length about 2 inches with damaged caudals.

**Astyanax hauxwellianus** (Cope). Fig. 28.

*Tetragonopterus hauxwellianus* Cope, Proc. Amer. Philos. Soc. Phila., XI, 1869-70 (August 19, 1870), p. 560. Nos. 8,137 (type) to 8,142, A. N. S. P., cotypes. Pebas, Equador. John Hauxwell.—Cope, *l.c.*, XVII, 1877-78 (May 17, 1878), p. 691. Peruvian Amazon. Prof. J. Orton. Coll. of 1873.

Gill-opening extending forward about opposite front of eye. Rakers 10? on lower part of first arch. Filaments a little longer than longest rakers. Isthmus compressed and narrow. Color in alcohol faded to dark brown, lower surface paler. Fins all brownish. A dusky blotch at base of caudal and a similar shade in humeral region. Iris brassy. Length  $2\frac{5}{16}$  inches (caudal damaged). Type.

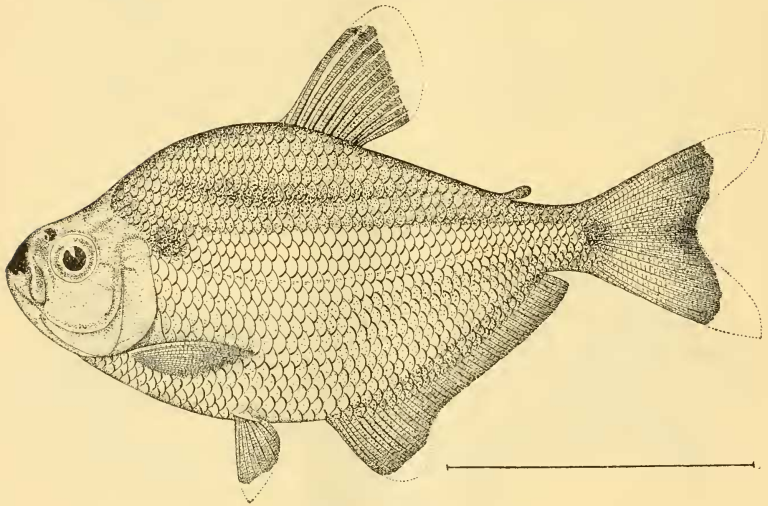


Fig. 28.—*Astyanax hauxwellianus* (Cope).

The other cotypes show: Head  $3\frac{1}{2}$  to  $3\frac{2}{3}$ ; depth 2 to  $2\frac{2}{5}$ ; D. usually III, 9, sometimes III, 8 or III, 10; A. usually IV, 40?, sometimes IV, 41?; total length  $1\frac{1}{8}$  to  $2\frac{3}{16}$  inches. The distinct lateral silvery band mentioned by Cope is now hardly evident.

Also 59 examples from the Orton Coll. of 1873, Peruvian Amazon, and an example from Robert Perkins, from between the mouth of the Rio Negro and the Peruvian Amazon.

**Astyanax pectinatus** (Cope). Fig. 29.

*Tetragonopterus pectinatus* Cope, Proc. Amer. Philos. Soc. Phila., XI, 1869-70 (August 19, 1870), p. 560. No. 8,090, A. N. S. P., type. Pebas, Equador. John Hauxwell.

Gill-opening extending forward about anterior third of orbit. Rakers about 6 + 9, slender, lanceolate, and less than filaments which are about half of orbit. Isthmus narrow and compressed. Scales

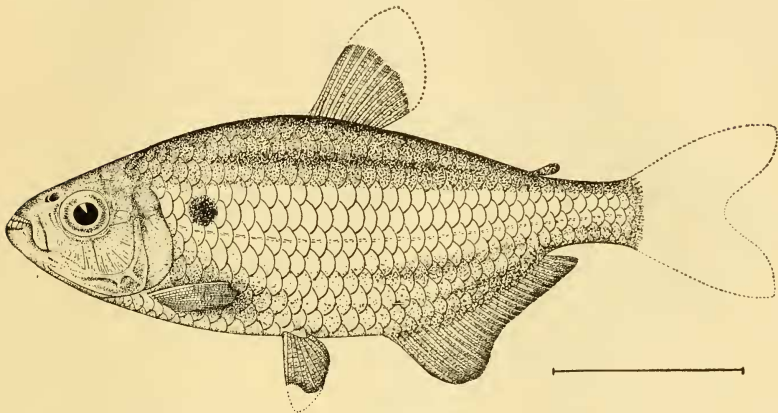


Fig. 29.—*Astyanax pectinatus* (Cope).

without striæ. Color in alcohol with fins and body nearly uniform brownish, former paler. Body more or less washed with silvery. Iris brassy-brown. Traces of a humeral blotch, though indistinct. Length  $1\frac{3}{4}$  inches (caudal damaged).

**Astyanax longior** (Cope). Fig. 30.

*Tetragonopterus longior* Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 691. Nos. 21,222 (type) and 21,223, A. N. S. P., cotypes. Moyabamba. Prof. J. Orton. Coll. 1874.

Predorsal region with a median obsolete keel and postventral region apparently trenchant, edges of body otherwise rounded. Gill-opening forward till about opposite front of eye. Rakers 9 + 11, lanceolate, and longest about  $\frac{3}{8}$  of filaments, which are  $\frac{5}{7}$  of orbit. Isthmus narrowly triangular. Each scale with several radiating striæ. Color in alcohol faded dull brownish, and back darker than silvered sides. A broad silver line, separating color of back from that of lower surface, extending from shoulder to base of caudal. Humeral blotch rounded

and a little longer than pupil. Fins all brownish. Iris brownish with rosy tint. Length  $3\frac{3}{8}$  inches (caudal damaged). Type.

Cope's description would give the depth of the body  $4\frac{7}{10}$  in its length without the caudal, while in the above example it is but  $2\frac{7}{8}$ . The head is said to be  $4\frac{1}{8}$ , while the above example shows it about  $3\frac{3}{8}$ . He gives

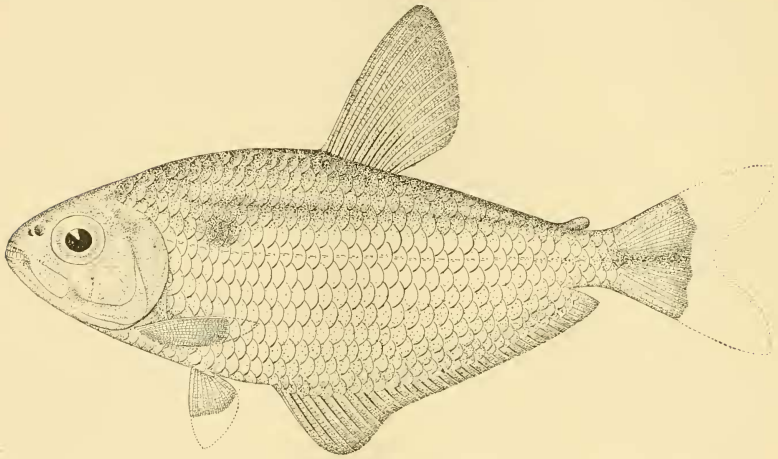


Fig. 30.—*Astyanax longior* (Cope).

the eye  $3\frac{1}{2}$  in the head, though the interorbital width is much less than  $1\frac{3\frac{3}{8}}{1\frac{0}{0}}$  in the eye, in fact but little less than the orbit itself. Both examples have Cope's original label.

***Astyanax maximus*** (Steindachner).

*Tetragonopterus* sp. *indet.* Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 691. Peruvian Amazon. Prof. J. Orton. Coll. 1873.

Head  $3\frac{3}{8}$  to 4; depth  $2\frac{2}{8}$  to  $2\frac{1}{2}$ ; D. 1, 9; A. iv, 28, 1 to 29, 1; scales 34 to 35 in lateral line to base of caudal and 2? more on latter; 7 scales in an oblique series back between origin of dorsal and lateral line; 7 scales from base of ventral to lateral line; 7 or 8 scales in a vertical series between origin of anal and lateral line; 17 scales before dorsal; pectoral a trifle less than head; ventral  $1\frac{1}{8}$  to  $1\frac{1}{2}$ ; snout  $3\frac{1}{8}$  to 4 in head, from tip of upper jaw; eye about 3; interorbital space  $2\frac{3}{8}$ ; length of larger example with damaged caudal  $4\frac{5}{8}$  inches. Rakers 10 + 16, lanceolate, slender, longest but little shorter than filaments which are about  $\frac{2}{3}$

diameter of eye. Pectoral reaches well beyond base of anal. Color in alcohol nearly plain brassy-brown, back a little darker, and caudal with a brownish streak from base out to ends of median rays. No evidence of a humeral blotch.

***Astyanax caucanus*** (Steindachner).

Head  $3\frac{3}{8}$ ; depth  $2\frac{2}{5}$ ; D. II, 9; A. IV, 42; scales (according to pockets) about 38 in lateral line to base of caudal; pectoral about  $1\frac{1}{16}$  in head; ventral  $1\frac{3}{5}$ ; snout about  $4\frac{2}{5}$  in head, measured from tip of upper jaw; eye 3; maxillary 3; interorbital space  $2\frac{2}{5}$ ; least depth of caudal peduncle about 3. A few small teeth at base of maxillary inside. Rakers about  $7 + 12?$ , and longest about  $\frac{3}{8}$  of longest filaments. In alcohol brownish, fins paler than body-color, and a silvery band, widest on supra-costal region, from shoulder to base of caudal where it terminates in a brownish spot. A brownish blotch on shoulder at origin of silvered lateral streak. Iris silvered brownish. Length  $2\frac{9}{16}$  inches. One example from Paramaribo. Dr. Hering.

***Astyanax bartlettii*** (Günther). Fig. 31.

*Tetragonopterus bartlettii* Cope, Proc. Acad. Nat. Sci. Phila., 1871 (1872), p. 260. Ambyiacu River, Equador. John Hauxwell.

Predorsal region with a median keel, rather obtuse, and postventral

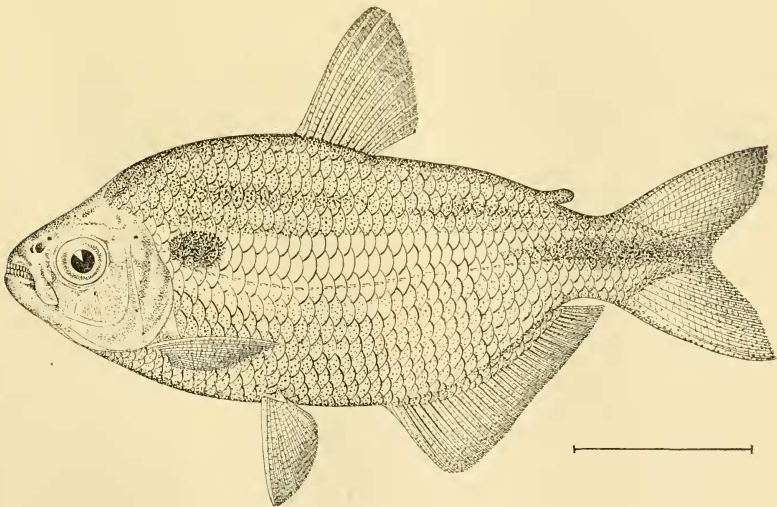


Fig. 31.—*Astyanax bartlettii* (Günther)

region but little trenchant, edges of body otherwise rounded. Gill-opening extending forward a trifle before front rim of pupil. Rakers about  $10 + 14$ , slender, lanceolate, longest about  $\frac{3}{5}$  of longest filaments and apparently rather weak. Filaments about  $\frac{2}{3}$  of orbit. A few striæ on each scale. Color in alcohol nearly uniform dull brownish, back a little darker and line of demarcation about level with upper margin of orbit distinct. A grayish elongate humeral blotch, most likely much faded, and in length nearly equal to diameter of eye. Base of caudal brownish and this color also extending out on median caudal rays. Fins otherwise all pale brownish. Iris brassy-brown. Length  $4\frac{1}{4}$  inches. Two examples.

*Astyanax finitimus* (Vaillant and Pellegrin). Fig. 32.

Predorsal region with a low median keel and one also on postventral, other edges of body rounded. Gill-opening not quite reaching front of orbit. Rakers  $8 + 13$ , lanceolate, longest about  $\frac{3}{5}$  of filaments and

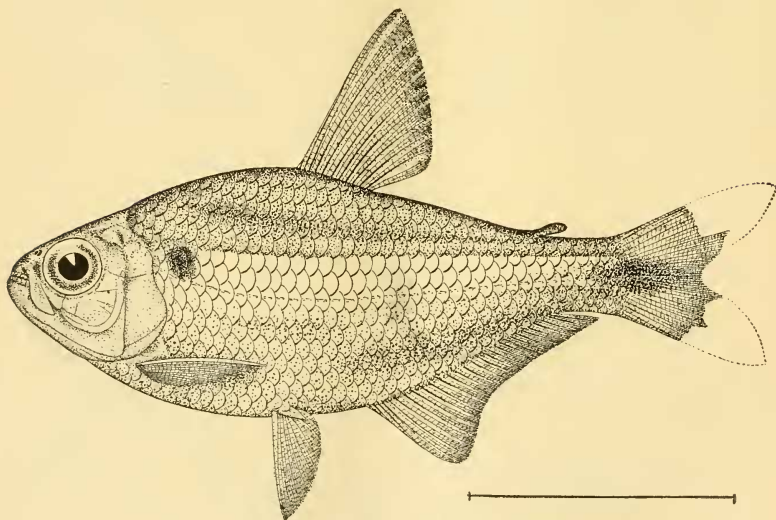


Fig. 32.—*Astyanax finitimus* (Vaillant and Pellegrin).

latter about  $\frac{1}{4}$  of orbit. Isthmus a little broadly triangular. Each scale with several radiating striæ. Color in alcohol brownish, back deeper and this color sharply separated from that of lower surface by a



broad silvery band from shoulder to caudal, where it becomes deep brown or dusky and extends out on median caudal rays. A dusky humeral blotch a little larger than pupil. Lower side and under portions of body silvered. Fins pale brownish, dorsal and caudal a trifle dusky. Iris brassy. Length  $2\frac{1}{8}$  inches (caudal damaged). Possibly from some part of Central America, most likely Nicaragua? Dr. J. F. Bransford. Five examples.

The others show: Head  $3\frac{1}{2}$  to  $3\frac{3}{4}$ ; depth  $2\frac{3}{4}$  to  $3\frac{1}{2}$ ; D. III, 9; A. III or IV, 24? to 26, 1; scales 36 in lateral line to base of caudal, and 2 more on latter; 8 scales obliquely back from origin of dorsal to lateral line; 8 scales in a vertical series between lateral line and origin of anal; eye  $2\frac{2}{3}$  to  $2\frac{1}{2}$  in head measured from tip of upper jaw; total length of specimens  $1\frac{7}{16}$  to  $3\frac{1}{2}$  inches (damaged caudals). The young examples are more elongate and have larger eyes in proportion, though at all ages the caudal and humeral blotches are evident.

Although the name *Tetragonopterus finitimus* was originally proposed by Bocourt (*Ann. Sci. Nat. Paris, Zool.*, 5, IX, 1868, p. 62), his account is entirely too brief and imperfect to permit identification. Prof. Vaillant and Dr. Pellegrin next describe examples from Guatemala which they identify with this species and which seem to agree with my own specimens.

**Astyanax mexicanus** (Filippi).

*Tetragonopterus mexicanus* Jordan and Snyder, Bull. U. S. Fish Comm., XIX, 1899 (1901), p. 125. Rio Ixtla at Puente de Ixtla, Morelos. Profs. D. S. Jordan and J. O. Snyder.

*Tetragonopterus streetsii* Cope, Proc. Acad. Nat. Sci. Phila., 1871 (November 28), p. 217. From the headwaters of the Coatzacoalcos River among the Cordilleras. Dr. T. Hale Streets.

*Tetragonopterus argentatus* Cope, Proc. Amer. Philos. Soc. Phila., XXII, 1885 (December 10, 1884), p. 168. In the city of Monterey. Prof. E. D. Cope. — Jordan and Snyder, *l.c.*, Rio Verde near Rascon. — Fowler, Proc. Acad. Nat. Sci. Phila., 1904 (April 7), p. 248. Del Rio and Devil's River, Texas. Dr. H. A. Pilsbry.

A very large series of examples of most all ages from Rio Ixtla at Puente de Ixtla, Morelos, and Rio Verde near Rascon, Mexico. These collected and presented by Profs. Jordan and Snyder. Also a large series from Monterey, Mexico, from Prof. E. D. Cope, and others from the same evidently from Mexico. Others from Del Rio and Devil's river, Texas, from Dr. H. A. Pilsbry. All show the following: Head 3 to 4; depth  $2\frac{1}{2}$  to  $3\frac{3}{4}$ ; D. III, 9, though sometimes II or III, 8, and rarely III, 10; A. III to IV, 17, 1 to 24, 1, usually 21 or 20, frequently 19 or 22, others with 23 and occasionally 24, though rarely 17 or 18; scales in lateral line to base of caudal 32 to 37, and 2 or 3 more on latter, usually 35, frequently 34 or 36, and rarely 32, 33 or 37; 7 or 8 scales in an oblique

series back from origin of dorsal to lateral line; 6 scales from base of ventral in a vertical series to lateral line, sometimes 7, rarely 5, and same between origin of anal and lateral line; 13 to 19 scales before dorsal, usually 15 to 16, less frequently 14 or 17, and rarely 13, 18 or 19; eye  $2\frac{1}{4}$  to  $3\frac{1}{2}$  in head, measured from tip of upper jaw, larger measurements in young; length of specimens  $1\frac{3}{16}$  to  $4\frac{3}{8}$  inches.

*Astyanax aneus* (Günther) is a closely related species differing chiefly in the absence of maxillary teeth, according to Dr. Meek's account. The other characters are seen to be more or less correlated, as several of my examples of *A. mexicanus* which possess as many as 24 developed or branched anal rays (would be 26 or 27 evidently according to Dr. Meek's count) also have well-developed basal maxillary teeth.

A number of examples, possibly cotypical of *Tetragonopterus streetsii* Cope, have uncertain data. They are included in the above measurements, and are Nos. 32,371 to 32,426, A. N. S. P.

***Astyanax fasciatus* (Cuvier).**

*Tetragonopterus fasciatus* Cope, Proc. Amer. Philos. Soc. Phila., XI, 1869-70 (August 19, 1870), p. 566. Para. Mr. De Schulte Buckow.

Head  $3\frac{1}{2}$ ; depth  $2\frac{2}{3}$ ; D. III, 9; A. IV, 26; scales 34 in lateral line to base of caudal, and 3 more on latter; 6 scales in an obliquely vertical series from origin of dorsal to lateral line; 6 scales in a nearly vertical series from origin of ventral to lateral line; 14 scales before dorsal; snout 4 in head, measured from tip of snout; eye 3; interorbital space  $2\frac{2}{3}$ ; least depth of caudal peduncle  $2\frac{1}{4}$ ; pectoral  $1\frac{1}{8}$  in head, from tip of mandible; ventral  $1\frac{3}{8}$ . Several minute maxillary teeth. Rakers about 9 + 15 on first arch, those on ceratobranchial largest, though shorter than filaments. Each scale of body with several striæ. Posterior distal extremity of maxillary extending back till opposite pupil. Humeral and caudal spots pale. Rather broad pale or silvery band on side of trunk evident. Iris brassy-brown and side of head silvery. Length  $2\frac{7}{8}$  inches. One example.

I accept the above name, as Dr. Günther pointed out the inconsistencies of Cuvier's figure and description, also when compared with other accounts. The examples identified by Prof. Ulrey (*Ann. N. Y. Acad. Sci.*, VIII, 1893-95, p. 284) as *Tetragonopterus fasciatus* (Cuvier), and credited to Dr. Eigenmann, with the developed anal rays 19 to 25, would seem to indicate a rather unusual range of variation.

***Astyanax eigenmanniorum* (Cope).**

*Tetragonopterus eigenmanniorum* Cope, Proc. Amer. Philos. Soc. Phila., XXXIII, 1894 (January 5), p. 89, Pl. 6, fig. 8. Nos. 21,598 (type) to 21,602, and 21,627 and 21,628, A. N. S. P., cotypes. Brazilian province of Rio Grande do Sul. H. H. Smith.

Predorsal region with median keel. Apparently a low keel on each

side of preventral region. Postventral region trenchant and edges of body otherwise rounded. Gill-opening extending forward a little beyond front margin of pupil. Rakers 8 + 10? (damaged), slender, pointed, and shorter than filaments. Isthmus narrow and compressed. A few striæ on each scale. Color in alcohol pale brownish, back darker than lower surface and traces of a pale or silvery band from eye to base of caudal. An indistinct brownish humeral blotch and another at base of caudal, also extending out on median rays of latter. Fins pale brownish. Eyes silvered. Length  $2\frac{9}{16}$  inches (caudal damaged). Type.

The other examples all show: Head  $3\frac{1}{2}$  to  $3\frac{3}{4}$ ; depth  $2\frac{2}{3}$  to  $2\frac{3}{4}$ ; D. III. 9, rarely II, 8; A. IV, 21, 1 or IV, 22, 1, usually latter; scales 30 to 34 in lateral line to base of caudal and 2 or 3 on latter; 6 scales obliquely back from origin of dorsal to lateral line; 5 or 6 scales from origin of ventral to lateral line in a vertical series; 13 to 15 scales before dorsal, usually 14; eye  $2\frac{2}{3}$  to  $2\frac{3}{4}$  in head; total length of examples 2 to  $2\frac{5}{8}$  inches.

This form has been united with *Astyanax fasciatus* (Cuvier) by Prof. Ulrey. The above characters will show that it had at least best be regarded as distinct, if only provisionally. Further, it may be stated as differing principally from *A. fasciatus* in the fewer anal radii. All of the above characters are also constant, and it is possible to separate these specimens from those representing *Astyanax laticeps*, as Cope rightly determined. I shall therefore be obliged to remove the latter from the synonymy of *A. fasciatus*, where it has also been placed by Prof. Ulrey, as it differs principally in still fewer anal radii. Thus from an examination of the material before me I shall refuse to consider *A. eigenmanniorum* and *A. laticeps* either as variations of *A. fasciatus* or in fact either as the same species. Finally Cope's description and figure of *A. eigenmanniorum* may hardly be styled excellent, much less that it leaves little doubt that the fish in question is simply a variation of *T. fasciatus*.

***Astyanax iheringii*** (Boulenger).

*Tetragonopterus pliodus* Cope, Proc. Amer. Philos. Soc. Phila., XXXIII, 1894 (January 5), p. 90, Pl. 5, fig. 5. Nos. 21,578 (type) and 21,579, A. N. S. P., cotypes. Brazilian province of Rio Grande do Sul. H. H. Smith.

Predorsal region with median rounded ridge, and postventral trenchant, edges of body otherwise rounded. Gill-opening reaching front of pupil. Rakers about 10 + 12, short, lanceolate, and longest about  $\frac{1}{3}$  of longest filaments which are about equal to  $\frac{1}{2}$  of vertical orbital diameter. Isthmus triangular and rather broad. Each scale with several radiating striæ. Color in alcohol brownish, lower portion of

body, from level with upper edge of eye, silvery. A lateral silvered streak from eye to caudal. Traces of a faint humeral and caudal blotch. Dorsal and posterior edge of caudal brownish. Iris dull orange. Length  $2\frac{1}{8}$  inches. Type of *Tetragonopterus pliodus* Cope.

An example labelled Montevideo, Uruguay, received from Cope.

Cope was evidently in error in stating that the humeral and caudal spots were wanting, as even now the former is present though indistinct, and the median caudal rays are darker than the rest of the caudal fin. There is also a dull brownish shade at the base of the caudal. Outer portions of dorsal, caudal and anal brownish, not exactly "finely specked with black" as stated by Dr. Boulenger.

**Astyanax laticeps** (Cope).

*Tetragonopterus laticeps* Cope, Proc. Amer. Philos. Soc. Phila., XXXIII, 1894 (January 5), p. 89, Pl. 6, fig. 7. Nos. 21,852 (type) to 21,863 and 21,743 to 21,747, A. N. S. P., cotypes. Brazilian province of Rio Grande do Sul. H. H. Smith.

Predorsal region with a median keel and postdorsal with an obsolete median ridge with one on each side. Preventral region apparently rounded. Postventral region with median keel. Gill-opening extending a little before front of pupil. Rakers 9 + 12, slender, pointed, and a little less than longest filaments. Isthmus narrow and compressed. Color in alcohol pale brownish, back darker than sides and lower surface, and a silvery band from shoulder to base of caudal, its width less than orbit. Body, especially lower surface and side of head, more or less silvered. A rounded dusky humeral blotch, and a dusky dash at base of caudal continued out on median rays of latter. Fins plain pale brownish. Iris brassy with a plain pale brownish ring. Length  $2\frac{2}{3}$  inches (caudal damaged). Type.

The other examples show: Head  $2\frac{2}{3}$  to  $3\frac{1}{2}$ ; depth  $2\frac{1}{2}$  to 3; D. III, 9; A. IV, 18, 1, rarely IV, 19, 1; scales 30 to 35 in lateral line to base of caudal, and usually 3 or 4 more on latter; 14 to 16 scales before dorsal, usually 15; 6 to 8 scales in an oblique series back from origin of dorsal to lateral line, usually 7; 6 or 7 scales from origin of ventral to lateral line, usually 6; eye 3 to  $3\frac{1}{3}$  in head, from tip of upper jaw, usually but little over 3; total length  $1\frac{1}{8}$  to  $2\frac{5}{8}$  inches.

This species has been united with *Astyanax fasciatus* (Cuvier) by Prof. Ulrey (*Ann. N. Y. Acad. Sci.*, VIII, 1893-95, p. 283). *A. laticeps* has three distinct small denticles at the base of the maxillary.

**Astyanax lineatus** (Perugia).

*Tetragonopterus lineatus* Cope, Proc. Amer. Philos. Soc. Phila., XXXIII, 1894 (January 5), p. 107. Near Chapada in Matto Grosso from the headwaters of the Paraguay. H. H. Smith.

Head  $3\frac{1}{2}$ ; depth  $2\frac{2}{3}$ ; D. III, 9; A. IV, 25, 1; scales 33 in lateral line to

base of caudal, and 3 more on latter; 7 scales in an oblique series back from origin of dorsal to lateral line; 6 scales in a vertical series from base of ventral to lateral line, and same number from origin of anal to latter; about 15 scales before dorsal; pectoral  $1\frac{1}{4}$  in head; ventral  $1\frac{3}{8}$ ; lower caudal lobe 1; snout  $3\frac{3}{8}$  in head, measured from tip of upper jaw; eye 3; interorbital space  $2\frac{3}{8}$ ; least depth of caudal peduncle  $2\frac{3}{8}$ . At least one small denticle at base of maxillary. Posterior distal extremity of maxillary extending till opposite anterior margin of pupil. Rakers about 9 + 15, slender, pointed and longest much shorter than filaments. In alcohol with a pale dusky humeral blotch. A dash of dusky on middle of side of caudal peduncle at base of caudal, fading out over posterior portion of anal, though posterior it extends out on middle caudal rays. About ten distinct longitudinal brownish lines on body, darker on back, and made up of dark brownish specks or dots. Iris brownish with a darker brownish ring. Length  $3\frac{1}{8}$  inches.

Dr. Steindachner's figure in *Sitz. Ak. Wiss. Wien*, C, 1891, p. 368, Pl. 2, fig. 1, does not show the dusky streak on the side of the caudal peduncle.

**Astyanax chapadæ** sp. nov. Fig. 33.

Head  $3\frac{3}{8}$ ; depth 3; D. III, 8; A. IV, 18; P. I, 9; V. I, 7; scales 39 in lateral line to base of caudal, and 3 more on latter; 6 scales from origin of dorsal obliquely back to lateral line, and 4 in same way from origin of adipose fin; 4 scales between origin of ventral and lateral line obliquely forward; 4 scales between origin of anal and lateral line; 16 scales before dorsal; width of head  $1\frac{1}{8}$  in its length; depth of head, over middle of orbit,  $1\frac{1}{2}$ ; snout  $3\frac{1}{2}$ ; eye 3; maxillary  $2\frac{1}{2}$ ; interorbital space 3; mandible  $2\frac{3}{8}$ ; length of depressed dorsal  $1\frac{1}{6}$ ; pectoral  $1\frac{2}{5}$ ; ventral 2; upper caudal lobe  $1\frac{1}{2}$ ; least depth of caudal peduncle  $2\frac{3}{8}$ .

Body elongate, compressed, rather ovoid, lower profile a little more convex than upper, and greatest depth at origin of dorsal. Predorsal region rounded. Postdorsal region with a median obtuse keel. Pre-ventral region rounded. Postventral region slightly trenchant. Caudal peduncle compressed, and its least depth about  $\frac{2}{3}$  its length.

Head a little long, somewhat attenuated, well compressed, muzzle a little pointed, upper profile a little concave above eye posteriorly, and lower profile rather evenly convex. Snout a little long, convex, and produced a little beyond tip of mandible. Eye circular, a little superior and its center about first  $\frac{2}{3}$  in head. Mouth a little oblique. Maxillary obliquely vertical, its distal expanded extremity reaching about opposite front margin of pupil and its width about half of diameter of same. Mandible strong. Lips rather fleshy. Teeth in jaws mostly

quindentate, especially those in mandible anteriorly which are also long and pointed, and five in each outer series above. At least three small serrated teeth along base of maxillary. Tongue elongate, fleshy and not free. Nostrils together near upper front rim of orbit. Interorbital space a little convex. Greatest width of infraorbital rim a little less than orbit or much broader than greatest exposed width of opercle.

Gill-opening extending forward opposite front margin of pupil. Rakers about  $7 + 10$ , lanceolate, rather far apart, and longest about  $\frac{3}{5}$  of longest filaments. Filaments about equal to pupil. Isthmus narrow. Branchiostegals 4.

Scales large, well striated, largest on flanks, and in longitudinal

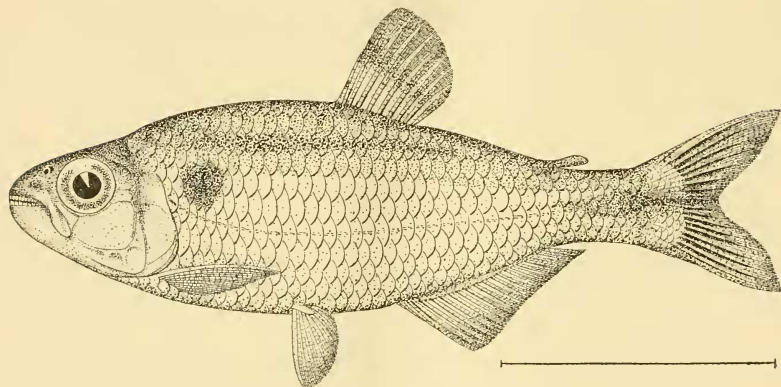


Fig. 33.—*Astyanax chapadæ* Fowler.

series parallel with lateral line. Basal anal sheath low and of small scales. Base of caudal well covered with small scales. Axillary ventral scale about  $\frac{1}{3}$  length of fin. Lateral line well decurved and running rather low posteriorly to base of caudal. Tubes simple.

Origin of dorsal a little nearer base of caudal than tip of snout, fin low, and when depressed reaching  $\frac{3}{4}$  of space to base of caudal. Adipose fin small, its origin near last third in space between origin of dorsal and base of caudal, or just behind base of last anal ray, and length of fin less than orbit. Origin of anal about opposite base of penultimate dorsal ray, or about midway between that of pectoral and base of caudal. Caudal rather small, emarginate, and lobes rounded. Pectoral falling a little short of ventral. Ventral



inserted nearly midway between tip of snout and tip of last anal ray, or well before dorsal, and reaching about  $\frac{3}{4}$  of space to anal. Vent close in front of anal.

Color in alcohol brown, especially back, sides and lower surface silvered and pale. A humeral blotch. A faint trace of a slightly lighter silvered band from shoulder to base of caudal, posteriorly becoming plumbeous though only slightly dusky at base of caudal, and same shade also continued out on median caudal rays to their tips. Base of each caudal lobe with a pale straw-colored blotch about size of pupil, then membranes between rays blackish and fading out into pale dusky posteriorly. Dorsal brownish with an indistinct dusky cross-streak. Other fins all pale and unmarked. Iris brownish.

Length  $2\frac{7}{8}$  inches.

Type, No. 21,828, A. N. S. P. Near Santa Anna da Chapada, in Matto Grosso, Brazil, from the headwaters of the Paraguay. August, 1884. H. H. Smith. Prof. E. D. Cope. Also paratype, No. 21,829, A. N. S. P., with same data.

This species is closely related to *Astyanax moenkhausii* (Eigenmann and Kennedy), from which it differs chiefly in the coloration. *A. paucidens* (Ulrey) and *A. jenynsii* (Steindachner) both differ in the fewer scales, apparently not more than 33.

(Named for Santa Anna da Chapada, province of Matto Grosso, Brazil.)